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MENTAL SYMPTOMS OF BRAIN DISEASE

BERNARD HOLLANDER, M.D.

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THE MENTAL SYMPTOMS OF BRAIN DISEASE

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THE MENTAL SYMPTOMS OF BRAIN DISEASE

AN AID TO
THE SURGICAL TREATMENT OF INSANITY,
DUE TO INJURY, HÆMORRHAGE, TUMOURS,
AND OTHER CIRCUMSCRIBED LESIONS OF
THE BRAIN

BY

BERNARD HOLLANDER, M.D.

WITH PREFACE

BY DR. JUL. MOREL

LATE BELGIAN STATE COMMISSIONER IN LUNACY

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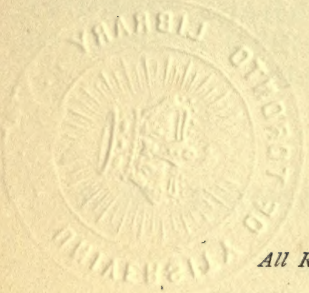

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PREFACE

In my long experience as Superintendent of Asylums and as Medical Inspector in Lunacy I have often had cause to notice the imperfections of lunatic asylums, being *asylums* for custody more than hospitals for scientific study and treatment of the insane. I called attention to this regrettable state in many of my publications, more particularly in *La Réforme des Asiles d'Aliénés*, in which I advocated greater facilities to be granted for the early admission of curable patients, for the appointment of expert alienists on the medical staff, for the establishment of pathological laboratories, and the appointment of an adequate number of educated and properly trained nurses. So long as we had no systematic investigation of the nature of insanity, no progress could be made in the recovery-rate of patients; but now, inasmuch as the scientific movement in psychiatry has spread, and we have more expert alienists conversant with psychology and the physiology and pathology of the brain, more

men animated by a true scientific and humanitarian spirit, eager to advance their science, better results are bound to follow.

Dr. Bernard Hollander belongs to this class of scientific explorers. He has devoted himself to the investigation of the localisation of mental functions in the brain, based on the clinical records and pathological observations published in the medical literature of the entire civilised world. He has imposed on himself an enormous work, requiring not only untiring industry but great expert knowledge, and he has given us in this book the practical results of his labours.

His book contains a vast amount of evidence on the material basis of our sensations, emotions, instincts, and higher mental attributes, and their morbid manifestations, of the utmost importance to the psychologist and physiologist, and most of all to the physician in the diagnosis of focal lesions; and many of the cases quoted by him of patients suffering from various psychical abnormalities, including some successful ones of his own, show the possibility of surgical operation for the cure of insanity in circumscribed brain disease.

It is my conviction that Dr. Bernard Hollander has contributed to psychiatric literature a masterwork containing immense material for future

research, and opening the way for the conquest of that much dreaded disease, insanity.

Although his views are confirmed by a legion of pathologists and physiologists, with the modesty of the true philosopher, he asks only for investigation and discussion, which, personally, I am sure will not fail to redound to his glory.

JUL. MOREL, M.D.

GHENT, *May* 1910.

INTRODUCTION

Among the many serious problems with which states and communities are confronted to-day, there is probably none that rivals in importance, whether viewed from a medical, social, economic, or philanthropic standpoint, the problem of the prevention and treatment of that most serious, most dangerous, most prevalent, and most far-reaching in effect of all diseases known to medical science—insanity. Yet as regards our knowledge of mental disorders and their successful curative treatment, it is generally acknowledged that until recent years very little progress has been made in this branch of medical science, the chief reason being that the initial stages of lunacy, unlike those of other diseases, rarely come to the notice of the physician, and that by the time a patient can be certified for medical care in an Institution for the Insane, the disease has in many cases already progressed so far as to make the methods of treatment that can be applied in the early stages no longer effective.

It is to the study of the initial states that we must apply ourselves in order to obtain a cure, for it is in these initial states that the disease is still limited and we can diagnose the seat of the lesion. As Sir James Crichton-Browne, Lord Chancellor's Visitor in Lunacy, has said—

"We must aim at an anatomical and a pathological diagnosis, and these are to be reached only by a careful study of symptoms and of their mode of onset and associated conditions. We are perhaps far off any success in localising and characterising mental diseases, but the endeavour to do so should at least be made; and that it may be made, trustworthy clinical records are a first requisite."

These words express exactly the aim of this book, which is a collection of clinical records of the mental symptoms of localised brain lesions, as perfect as the author's limited opportunities allowed, and neurologists, surgeons, as well as lunacy physicians, have recorded them in medical literature. Thus a beginning is made which should lead to more detailed and possibly more accurate observations, of which presently wide opportunities will be given by the establishment of Reception Hospitals in London and other municipalities.

This book deals chiefly with gross macroscopic lesions of the brain due to injury, hæmorrhage,

tumours, etc., which have hitherto been almost entirely neglected from the point of view of their intimate psychic symptoms, for the asylum physician rarely gets to see this class of cases, and the neurologist fixes his attention almost exclusively on the physical signs of brain disease.

The facts disclosed in this work should be *primarily* of importance to physiological science, for they throw light upon the connection of the different parts of the brain with the intellect, the instincts, emotions, and actions of human beings. *Secondly*, they should be of value in the treatment of insanity, rendering it possible to treat focal lesions by surgical operation. As Mills has said: "The surgical aspect of cerebral localisation is naturally that which appeals to all as the most practical." It will be seen that amongst the cases so treated and quoted by the author there are not only cases of injury to the head, but also inflammatory lesions and new growths; and while it must be admitted that the cases in which surgical interference has been resorted to are still very small in number, we may be sure that as our knowledge of the localisation of mental functions in the brain becomes more definite, operative treatment will become as common in the case of brain disease as it is already in disease of other parts of the body. But we must especially emphasise that we speak

throughout this book of focal lesions, and not of general affections and degeneration of the brain or the various forms of insanity due to toxins. *Thirdly*, as is evident from the remarks already made, the book should be of value to the pathologist, in teaching him what he might look for.

Unfortunately, psychiatry still contains within its borders diverse and conflicting opinions in accordance with the mental bent and opportunities of the different authors, and thus we have metaphysicians, laboratory men, and clinicians disputing with one another. It is very probable, therefore, that the conclusions the author has come to will be at variance, at least at first sight, with the experience or opinion of some of the readers. It is to be hoped, however, that the manner in which the subject is presented, and the large amount of authenticated clinical material contained in this work, will achieve for it kindly consideration and respectful indulgence. It is not the author's wish that anything contained therein should be taken for granted. He is satisfied to have indicated the line on which, in his opinion, research might be undertaken with better results than we have hitherto achieved.

The value of this book depends in great measure on the vast number of cases cited. Since these cases have been collected at random, the chronological

order has not been observed, but they have been arranged according to their origin, so as to facilitate their verification and to enable other investigators to obtain, if wanted, further details from the original sources in the easiest manner.

Finally, the author desires to express his deep indebtedness to Dr. Jul. Morel, late Belgian State Commissioner in Lunacy, for showing his appreciation of this work by writing a preface to it, and wishes to thank also Dr. T. Claye Shaw for looking over the original manuscript.

BERNARD HOLLANDER, M.D.

57 Wimpole Street, London, W.
July 1910.

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THE MENTAL SYMPTOMS OF BRAIN DISEASE

CHAPTER I

THE FUNCTIONS OF THE CORTEX OF THE BRAIN

Of all the organs in the human body, the brain ranks highest in importance; yet, strange to say, until about a century ago it received hardly any attention, and even at the present day the knowledge of its *mental* functions is still very obscure. True, no one would agree to-day with Sir William Hamilton and John Stuart Mill, who still taught that "mental phenomena do not admit of being deduced from the physiological laws of our nervous organisation," but it seems that the influence of antiquated metaphysics based on the results of self-introspection has not yet worn off entirely. For mind is still regarded by some as if it consisted of intellect alone, whereas we all *feel*, as well as think, with our brains. If it were not so, of what use would be

the animal brain, as, for instance, that of the mouse, which has in proportion to the size of its body more brain than man (according to Wagner), and should therefore be more intellectual than any human being? Others still cling to the long-exploded view that all knowledge is derived from sensation, and that therefore the sensory centres, especially those of sight in the occipital lobes, are the centres for the intellectual operations; quite ignoring the fact that the occipital region preponderates in the lower races and the monkey species almost in the same proportion as the frontal region preponderates in civilised man (Elliot Smith and Brodmann), and that the latter is structurally the most perfect; and ignoring also that animals and savages have keener and in many respects more perfect senses than civilised man, and should therefore, if this view were correct, be his superior in knowledge and understanding.

Thus in one of the latest text-books by a well-known Scotch neurologist we find it stated—

"*All knowledge is derived through the exercise of the senses. The man who can see best is the man who understands most, and who therefore knows best what to look for.*"

"*Now it has been calculated that of all the stimuli from the outside world which reach the brain, nine-tenths come from the organs of sight, so that the blind are dependent on the remaining one-tenth for the scenery of their mental world.*"

According to this view, all knowledge would be

a knowledge of sensations. The different talents, for music, poetry, mathematics, etc., should all be simple modifications of one or more of the five senses. It would lead us to assume that men are born with equal original mental capacity; opportunities and education determining the difference of subsequent development.

If all our ideas are derived from the senses, what becomes of the general and purely intellectual ideas, whose significance is wholly independent of the material world? For example, "there is no effect without a cause."

Men with sight only could see, but would not perceive; men with hearing only would hear, but would not understand. Why should the sensory region be just the intellectual region? The feelings and passions can be aroused just the same, and much quicker, as the result of the objective perception gained through the medium of the eye. Not only does the sensation of sight arouse emotion, but it differs according to the emotion we are already in.

If all our ideas come from the senses, then the mind should be always proportionate to the greater or less delicacy of these same senses. Although the senses form the inlet for a great variety of ideas, yet it will often be found that the power of abstraction and combination of thought generally is greatest in those whose senses are not eminently developed. If the existence of Homer be doubted,

there certainly was Milton, who was blind at an early age, but what imagination can be stronger and more brilliant? Beethoven was deaf while still a fairly young man; his deafness accentuated his natural disposition to suspicion, but he did not cease to compose music. Laura Bridgman, the blind deaf-and-dumb woman, was remarkably intelligent, and Miss Helen Keller, a similarly afflicted pupil of the Perkins Institution, has even taken the first prize at an examination in competition with normal girls, and has now become an accomplished authoress.

Those who hold that knowledge results wholly from the experience of the individual, fall into an error as great as if they were to ascribe all bodily growth and structure to exercise, forgetting the innate tendency to assume the adult form. Were the infant born with a full-sized and completely constructed brain, their position would be less untenable. But as the case stands, the gradually increasing intelligence displayed throughout childhood and youth is more attributable to the completion of the cerebral organisation than to the individual experiences—a truth quickened by the fact that in adult life there is sometimes displayed a high endowment of some faculty which, during education, was never brought into play. Doubtless, experiences gathered by the individual furnish the concrete materials for all thought. Doubtless, the organised and semi-organised arrangement existing among the cerebral nerves can give no knowledge

until there has been a presentation of the external relations to which they correspond. And doubtless, the child's daily observations and reasoning aid the formation of these involved nervous connections that are in process of spontaneous evolution, just as its daily gambols give aid to the development of its limbs. But saying this is quite a different thing from contending that its intelligence is wholly produced through its experiences. As Herbert Spencer has pointed out, this is an utterly inadmissible doctrine—a doctrine which makes the presence of a brain meaningless, a doctrine which makes idiocy unaccountable.

It is not the perfection of the senses which gives intelligence to the brain, but it is the perfection of the brain which determines the employment of the senses. For this reason we are disposed to think that exaggerated notions are entertained as to what experimental psychology can actually accomplish. It is practically restricted to the measurement of sensations and movements and the gaps between them, and of the simplest mental processes.

The conclusions drawn from the results of experiments on animals have also proved unsatisfactory. This is admitted by the experimentalists themselves.

"There is, perhaps, no subject in physiology of greater importance and general interest than the functions of the brain," says Dr. Ferrier, "and there are few which present to experimental investigation

conditions of greater intricacy and complexity. No one who has attentively studied the results of the labours of the numerous investigators in this field of research can help being struck by the want of harmony, and even positive contradictions, among the conclusions which apparently the same experiments and the same facts have led to in different hands."

Numerous instances can be quoted where, even in the last few years, conclusions have been confidently drawn from some experiment, and made to appear by their author as truths fixed once and for all time, and yet by the next investigator they have not only been controverted but perhaps fairly overturned.

Thus it is interesting to examine the various changes in the localisation of the so-called sensory-motor centres since their discovery about forty years ago. Compare the localisations of Ferrier, filling up almost the entire brain, with those by Horsley and Beevor, and the latter again with the still more restricted field of Sherrington and Grünbaum, confirmed by C. and O. Vogt on monkeys and F. Krause on man, and finally the latest statement by Sir Victor Horsley (*British Medical Journal*, 17th July 1909) that "so-called volitional movements are not alone generated from the brain through the 'motor' area or pre-central gyrus, but must also be subserved by other parts." In support of his views he quotes "the most striking experiment initiated by Goltz,

who removed in a dog the cortex and a large portion of the anterior region of the thalamus, and who found that the animal was able to stand and to walk."

Carville, Duret, Hermann, and Adamkiewicz (*Neurologisches Centralblatt*, 1907) have removed the entire cortex of the brain and found that the animal suffers not the least loss of muscular function. This is true of the lower animals; but even in higher animals, if the so-called motor-area is entirely excised, the ensuing paralysis is recovered from in a few days or weeks. The very fact that there exist such patent differences between the effects of destruction of the cerebral hemispheres in different orders of animals ought, one would think, to inspire caution in the application to man of results obtained only by experiments on the brains of animals.

Man has a much larger and by far more complicated brain than the lower animals, although he has not anything like the same amount of muscular energy and power which many of them possess.

Some savage nations have as much motor power and often more delicate senses; it would be from them that we ought to expect the most profound philosophy and the feeblest instincts.

Those who have observed the defective brains of idiots must be aware that these centres are often without any corresponding motor or sensory defect.

Physiology should take a more comprehensive view, and in particular not neglect the facts of clinical medicine and human pathology. We hold

with Professor Tanzi, who in his *Textbook of Mental Diseases*, 1909, has said: "As the study of experimental localisations would appear to have reached its limit, . . . physiologists, in common with clinicians and those who investigate the question from other standpoints, have now no reason to refuse space for a psychical zone, the existence of which forces itself upon us, even apart from the testimony of experimental researches."

The time has come that we may ask ourselves: Has the irritation and mutilation of the brains of living animals thrown any light on the mental aptitudes and dispositions of man, and are they likely ever to do so? True, however ridiculous the results of vivisection, such as one renowned experimenter's conclusion "that the function of the frontal lobes is the innervation of the muscles of the back," they meet with approval, and the Proceedings of Academies are filled with it; but sober-minded men have come to see that this method of investigation has reached its limit, and that even its supposed assistance in operations for certain forms of epilepsy has not met with that success which has been anticipated.

The fact is that too much has been expected from experimental investigations into the functions of the brain. We cannot produce a thought or feeling at the point of the scalpel, and we must ever fail by this method to shed light on the variety of mental derangements. If we are to believe the experi-

menters, large portions of an animal's brain can be scooped out without any effect on its mental capacity, yet it is well known that a trifling injury to the brain of man may render him insane.

It is different, however, with those investigators who experimented on animals in order to verify their clinical observations. They knew what to look for, and therefore achieved some practical results, to which we shall have occasion to refer in the different chapters of this work.

Laboratory work is indispensable. All we want is to warn against its exaggerated estimation, by which all those who are engaged in it, and who explain the mysteries of life and disease by chemical, physical, and mechanical laws, are hailed as scientists, and none other are considered to deserve that name. Ever since the time of Flourens experiments on the brains of animals have been conducted in all parts of the world, and with what result? That the mental functions of the brain are still as much a mystery as they were a hundred years ago.

The exaggerated importance attributed to the results of experiments and the neglect of clinical observations has led to such widely contradictory statements, by men whom we all honour for their scientific attainments, as the statement of some that the *whole* brain serves for the higher intellectual operations, the statement of others that the *frontal* lobes only are the centres of reason and understanding, of others the *posterior* lobes only, while yet

some declare the *parietal* lobes to be the most significant of the entire brain. With such diversity of opinion, is it a wonder the knowledge of insanity and the treatment of the insane is the least progressive of all branches of medicine?

It is due to these causes that cases are quoted by various authors of cerebral wounds without injury to the mental powers. Were these observations as correct as their authors state them to be, it would be impossible to ascertain that the brain performed any mental functions at all. But the vague, indefinite manner in which all these examples are produced save the head and its contents from the imputation of being useless appendages.

"If the patient is free from delirium and can say 'Good morning,' and put out his tongue when told to do so, it is recorded that 'his mental faculties remained entire,' that 'there was no deficiency of intellect,' or that 'he was clear and collected to the last.' This testimony, of course, to be of any value, necessarily supposes a skilful and exhaustive exploration of the mind in all its departments, and a scrupulous attention to minute and intricate details in each particular case. Being founded, however, only upon the most superficial examination, it is not merely valueless but mischievous and misleading. To evidence of this kind must, I believe, be traced many fallacies which have impeded scientific progress, such as the statement that a whole hemisphere of the brain may be destroyed without the mind

suffering in any way, or that every part of the brain has been found disorganised in one case or another, without any derangement of the mind having existed." (Sir James Crichton-Browne.)

"That mental symptoms or mental deficiencies have not been recorded in cases of bilateral cerebral lesions is a negative statement of very little value. Unless a man becomes so demented as to neglect the ordinary wants of nature, or so furious, maniacal, or irrational as to require restraint, there are few engaged in the practice of medicine who think of inquiring narrowly into a patient's mental state; and even if more attention were directed towards this subject, are we in possession of any means of accurately gauging the mental condition of an individual so as to be certain that it has altogether escaped damage, notwithstanding the presence of a cerebral lesion? I see little to justify and much to contradict such an assumption. A man may not be incapacitated for the ordinary duties of life, but that his mental powers are altogether unscathed, even by a unilateral lesion, I venture to question." (Dr. David Ferrier.)

CHAPTER II

RECENT HISTOLOGICAL DISCOVERIES IN FAVOUR OF THE LOCALISATION THEORY

Not very many years ago localisation of function was considered impossible because of the supposed uniformity of the structure of the cortex of the brain. It is through the histological studies of recent years that the localisation theory has gained its most notable victory. Since Meynert and Betz,—that is, since 1874,—a large number of investigations have been undertaken into the microscopical formation of the grey matter of the brain, with the result that it was discovered that the brain surface consists of various strata of cells, and that there are histologically highly differentiated regions and areas, not only as regards the cellular elements and cell types, but as regards the structure of the fibres. Bevan Lewis, Clarke, Nissl, Bolton, Cajal, Campbell, Vogt, Mott, Brodmann have done most praiseworthy work in this direction. Unfortunately, here too, there is no uniformity of opinion even with reference to fundamental questions, as Dr. K. Brodmann in his most recent work on *Verglei-*

chende Lokalisationslehre der Gehirnrinde, Leipsic, 1909, shows in great detail. For our purpose it suffices to point out that each observer has given his own nomenclature and interpretation, and that the number of layers of cells described varies from five to nine. According to Brodmann, six is the correct number of cell-strata in the cortex of man and mammals.

Throughout the mammalian series there occurs in definite localities of the cortex the same characteristic structural formation, so that we can define homologous areas in the different animals, varying only in extent. From the primitive unstriated cortex a morphologically differentiated striated cortex is developed, which on transverse section shows a number of distinct regions of peculiar structure varying *firstly* as regards thickness, *secondly* as to the appearance of the cells in the various layers, and *thirdly* in quality. The cortex contains, therefore, a multiplicity of organs, of differentiated structural complexes, which we are led to assume from the analogy of other organs to have separate functions, so that the work hitherto performed by the whole brain is now split up and localised, the more precisely the higher the animal in creation. This process of division of labour is still going on.

Although these structurally differentiated areas are common to man and mammals, there is yet an insurmountable bridge between man and even the highest apes, and Huxley's statement that the

orang-outang is nearer man than the lower ape in brain formation is not correct. For man, unlike any mammal, is a "*brain* animal"—that is to say, he is distinguished by the mass of brain above all other distinctions. According to Henneberg and Wagner, the area of a hemisphere of the brain of man measures 110,000 mm., whereas a hemisphere of the orang-outang measures only 50,000 mm., and that of a lower ape like the macacus measures 30,000 mm. But it is not only as regards the quantity of brain that man differs enormously from the nearest mammal, the higher ape, but also as regards the thickness of the grey matter, its inner structure and its topographical differentiation. In these respects, too, the orang-outang is nearer the lower ape than he is to man. O. Vogt distinguishes 100 myelo-architectonic areas in the whole cortex, of which 50 are in the frontal lobes alone, whereas Th. Mauss (*Journal of Psychology and Neurology*, 1908) distinguishes 32 corresponding areas in the lower monkeys and 40 in the orang.

Elliott Smith and K. Brodmann discovered 24 distinct areas on the *surface* of each hemisphere of the brain, having identical anatomical structure in man and mammals.

These areas are—

Frontal Region

1. Area præ-frontalis.
2. ,, fronto-polaris.
3. ,, frontalis granularis.
4. ,, frontalis intermedia.
5. Area orbitalis.
6. ,, triangularis.
7. ,, opercularis.
8. ,, frontalis media.

Temporal Region

1. Area ecto-rhinalis.
2. ,, occipito-temporalis.
3. ,, temporo-polaris.
4. ,, temporalis inferior.
5. ,, temporalis media.
6. ,, temporalis superior.
7. Area para-insularis.
8. ,, temporalis transversa interna.
9. ,, temporalis transversa externa.

Parietal Region

1. Area præ-parietalis.
2. ,, parietalis superior.
3. ,, supra-marginalis.
4. ,, angularis.

Occipital Region

1. Area striata.
2. ,, occipitalis.
3. ,, præ-occipitalis.

This topographical differentiation of areas is the first step towards localisation. True, earlier histologists made localisations too, but not according to areas, but according to the appearance of particular cells in the various strata of the cortex; thus, for instance, attributing specific motor function to the giant pyramidal cells, which Brodmann shows is not correct. They designated the different strata of cells with terms describing physiological or psychical functions, such as "sensory," "perceptive," "association," "projection," "commemorative," and "psychical strata." "Such and similar terms," says Brodmann, "which one meets on every step, especially in modern psychiatrical-neurological literature, have no foundation; they are pure fiction, and serve no other purpose than to create confusion."

Between the two extremes of investigators such as Friedrich Goltz and Bernhard Gudden—tardy converts to the localisation theory — on the one hand, and Flechsig — who originated the myelo-

genetic theory of association centres—on the other, there are all varieties of opinions represented by Hitzig, Ferrier, Luciani, Seppilli, Tamburini, Horsley, Schäfer, Monakow, Bianchi, Tonnini, Christiani, Loeb, Lussanna, and Lemoine.

Progress in this direction is slow. Monakow is right in saying: "There must be something radically wrong in the way in which clinical observers and physiologists view the localisation of the brain, in the form the question is put, and in the deductions drawn from the observations made" ("New Views on the Question of the Localisation in the Brain," *Correspondenzblatt für Schweizer Aerzte*, 1909).

Most histologists and physiologists "search" and therefore "find" only centres for movement and sensation, optical, acoustical, and other areas, but they draw the line directly they get to psychical elements, forgetting that "behind those sensory and motor centres there lie also all those functions which constitute mental phenomena; a true correlation of which with their material substrata is even of greater importance, both theoretically and practically, than the mere determination of their physiological significance, and the effect of irritation and destructive lesions" (David Ferrier).

Bolton is almost the only one who has done really progressive work in furnishing histological evidence in support of the localisation of mental functions. His contributions to the pathology of insanity are of inestimable value.

Brodmann, Goltz, Rieger, Wundt, and R. Semon are absolutely against the localisation of *psychical* states in the brain; we must assume they are ignorant of the mass of clinical evidence already accumulated, which shows that psychical states as well as the corresponding sensations and movements are associated with definite regions in the brain.

We are dealing in this work with highly complex mental states, and objection will be made that it is absurd to try to localise such complex states. Will such objectors reflect that a beginning has to be made somewhere, and that the author is not to blame if the observers he has quoted have not made a more minute psychological analysis or are sometimes vague in their pathological descriptions. All he wants to prove is the principle that *the elementary psychical states and capacities are related to definite brain centres.* It was Gall who first originated this theory, as shown in detail by the author in his books on *The Mental Functions of the Brain,* and *The Unknown Life and Works of Dr. Francis Joseph Gall*; but Gall, being identified with the phrenological doctrine, has never received due justice for his anatomical and physiological discoveries, and is to this day almost completely ignored.

The dispute round this question has raged for over a century, and its seems that because of the non-recognition of this principle of the *localisation of mental function* so little progress has been made in the treatment of brain disease

and mental disorder. Surely the theory expounded is no more wildly hypothetical than the theories of the localisation of different functions in the various strata of cells—granular, infra-granular, and supra-granular—for example, by Evans (*Brain*, vol. xvi.), who sees in each of these layers of the occipital cortex the seat of the perception of one of the fundamental colours.

Brodmann puts himself, as regards the theory of localisation of *mental* function, in exactly the same position as Flourens has done as regards the physical function, *i.e.* the localisation of movements and sensations. Flourens claimed that, however large a portion of the brain be destroyed, the remainder will assume all the functions. Brodmann points out that Carville, Duret, and Soltmann are the only men of note nowadays who hold this view; yet he himself, as regards the psychical concomita, says the same, namely, that "for every psychical action the whole brain is at work, and that whatever psychical process is lost is made up again by the remainder of the brain."

Brodmann gives himself, however, a loophole of escape from an otherwise untenable position by admitting the possibility that complex psychical states may be connected as a "resultant" with certain defined areas, having, so to say, a "predilection" for them, but they are never the product of a morphological or physiological centre.

For the purposes of this book it matters little

whether certain complex psychical functions have a "predilection" for a "circumscribed and histologically distinct" part of the cortex, as in the cases quoted, or whether they are the "resultant" of numerous minor processes all over the brain, or whether all the elements of a complex psychical function are to be found associated with that particular centre. This must be a question for future discussion, after our clinical observations have received more extensive confirmation.

Bevan Lewis in 1883 had already pointed out (see *British Medical Journal*) some of the directions in which studies in cerebral localisation might advance our knowledge of insanity. He held that the localisation of cerebral function was the outcome of the great principle of evolution carried to its logical issues; that the alienist should rivet his attention upon the changes undergone by the material substrata of the mind; that he should strictly and closely study the objective manifestation of mental activity; that he should learn to examine the various limited lesions of the cortex as to area, depth, localised atrophy, relative bulk of convolutions, and tracts of ascending and descending degeneration.

Every decided advance in the knowledge of the localisation of functions has been due to the careful collection of cases with autopsies and the study of their common features.

It is by the observation of clinical and patho-

logical data chiefly that we can hope to discover the mental functions of the brain and their localisation. The material is already big enough to admit of definite conclusions with reference to some of the brain regions, and with reference to others we are in a position to advance hypotheses which, though they require further confirmation, may already prove useful in the diagnosis and treatment of particular mental disorders.

The first principles which we must consider as established are—

Firstly, "*all mental operations take place in and through the superficial grey matter or cortex of the brain*"; and secondly, that "*the cortex of the brain is not a homogeneous organ, but consists of a multiplicity of centres.*"

Unless these principles are admitted, mental disorders can neither be understood nor treated.

The cerebrum is the material organ through whose instrumentality all the processes of thought and feeling are carried on; and if we are to believe in anything like order or uniformity in its operations, we are bound to come to some doctrine of localisation.

The existence of facts, such as that injuries to the head affect not infrequently one or more of the mental powers, while others remain perfectly sound, makes it more than probable that different portions of the cerebral hemispheres have different functions allotted to them. Moreover, if physiologists grant that each portion of the nervous system which

governs motion is an independent centre of power, it is a fair inference that each portion of the nervous system governing the mental acts is also an independent centre of power. If, however, we are agreed that definite portions of the cerebral cortex subserve definite mental processes, there is a possibility that we may some day attain a complete organology of the brain-surface, a science of the localisation of the cerebral functions. Such a science—that is, a knowledge of the psychological centres of the brain in all their relations—is certainly one of the most important problems of the present day, the solution of which will work no small transformation in psychology, education, eugenics, and sociology, and last but not least, in the subject of this book, namely, psychiatry.

CHAPTER III

MENTAL SYMPTOMS IN LESIONS OF THE FRONTAL LOBES

THE CENTRES OF THE HIGHER INTELLECTUAL OPERATIONS

THERE are elementary feelings and propensities which man and animals have in common, and which exist for the preservation of the animal and man without consciousness, reflection, or active participation on the part of the individual being necessary. If it be admitted that we have elementary feelings in common with animals, but are distinguished from them by our greater intellect and higher sentiments, and if our first principle be admitted, that all mental operations take place in and through the brain, then we must expect that *we have some parts of our brain in common with animals and some which are distinctly human.* And this is so. For this purpose we must go to comparative anatomy and take the lowest animal which has a rudimentary brain, and observe the gradual development throughout the whole species of animals till we reach the highest apes, whose brain most closely resembles that of human beings. If we do so, we

shall see that, in accordance with the gradual development of the reasoning capacity of animals, so there is a part of brain, corresponding to the frontal lobes in man, which correspondingly increases in size and is relatively largest in the gorilla, chimpanzee, and orang-outang, though their frontal lobes are still smaller in size than those of the lowest human idiot. Since the other lobes in man and animals show no such disproportion, we may draw the inference that the frontal lobes are related to functions which are distinctly human, that they are the instruments for the higher intellectual operations and possibly the higher human sentiments.

If we study embryology and observe the growth of the human brain, we shall find that those parts which are the latest and highest acquisitions should grow last; the reflective and reasoning faculties being the latest to arrive at perfection, the frontal lobes are the last to develop.

If we now examine the brains of microcephalic idiots, we find that the arrested development is chiefly in the frontal lobes. Indeed, if we compare the frontal lobes of imbeciles with those of men distinguished for their intellectual qualities, we find a great contrast in their size, though the remainder of the hemispheres has attained to normal growth. The contrast is more eloquent than any language can express.

We also find that when the frontal lobes are destroyed by injury or disease, the processes of

judgment and reason are diminished, there is an inability to fix the attention, to follow a continuous train of thought, or to conduct intellectual processes, ultimately ending in complete dementia. We find, morever, that in such men the struggle between the lower instincts and ethical feelings is diminished or does not exist any longer, and instead of a rational man, we see a creature given over entirely to the satisfaction of his lower desires. Such is the case in all forms of lesions of the frontal lobes, and it does not occur in lesions of other parts of the brain.

Hyperæmia of the frontal lobes of the brain, or any other irritating pathological condition, causes an increased activity of the mental processes of perception, association, and reproduction. The patient forms numerous plans and projects, has a rapid flow of ideas, and through stimulation of the speech-centre is loquacious, but his stream of talk and ideas is perfectly coherent; it is only in the advanced stage that he may become incoherent. The other lobes of the brain being unaffected and deprived of the control of the intellect, manifestations of the natural feelings and animal spirits occur. There is a peculiar hilarity and tendency to jest, and there may be actual exaltation. The patient is free from hallucinations and delusions, knows his surroundings, and many men may fail to recognise in him anything abnormal. This state of mind is called "manie" by the Germans and French, and

is not the same as the English "mania," by which usually a furious state is meant, described by Germans as "Tobsucht."

In the hypomaniac, as the patient suffering from "manie" is sometimes called, all the psychical processes take place with unwonted alacrity and exuberance, creating in the mind of the patient joy, satisfaction, and self-confidence. There is euphoria, a happy state, and moria, a jocular state of mind. The good spirits of the hypomaniac seem, excepting for occasional slight abatement, to be inexhaustible; they almost never leave him; they make dangers invisible, misfortunes light, life easy, and its struggle pleasant. If some incident causes a patient whose frontal lobes are excited (as in "manie") ill-humour, it is not for long and certainly does not increase to blind fury; but the two forms of mania can occur together, and frequently do.

The consciousness in a vague way of an approaching mental disturbance may cause a depression to precede the maniacal attack.

A temporary state of depression may also follow the attack in consequence of the exhaustion after the excessive mental and motor activity, and partly from the recollection of the mental illness and a reflection on the consequences of the many foolish things said and done. Such depression is under the circumstances perfectly natural, and should not be mistaken for "melancholia."

Experiments on dogs and monkeys have shown

that after destruction of the frontal lobes the curiosity to observe, which is so marked in them, is lost; that they are not able to receive new impressions, or to remember or reflect on the old; and that, since they can no longer criticise, they become timid and easily excited. All the emotions and propensities remain intact, only increased in activity for want of control, but they show no longer gratefulness, cannot adapt themselves to new surroundings, neither learn anything new nor regain what they have forgotten. Experiments on animals thus confirm our view that the frontal lobes are the centres of perception and reflection, and the centres for the moral sentiments as far as their rudimentary existence can be demonstrated in the lower creatures, and that they are, in addition, centres of inhibition against the instinctive impulses.

Numerous other facts can be adduced in support of the view that the frontal lobes are the centres for the purely intellectual operations—

(1) The expansion of the frontal lobes in men engaged in intellectual pursuits has been repeatedly demonstrated by actual measurements.

(2) It has been shown that the frontal lobes vary in size and weight in different races according to their intellectual capacity.

(3) Anthropologists have demonstrated from examination of European skulls that the progress of civilisation has resulted in raising the anterior and flattening the posterior part of the head.

In confirmation of the views expressed, we cite herewith the results of the investigations by various well-known authorities:—

Broca's measurements demonstrate that intellectual work augments the anterior lobes.

The important researches made in reference to ancient skulls by the Abbé Frère, whose rich collection is in the Anthropological Museum at Paris, led him to the conclusion that the skulls of Europeans have increased in size since historic times, and that the progress of civilisation seems to have resulted in raising the anterior and flattening the occipital part of the skull.

Professor MacAlister, at the British Association Meeting, Edinburgh, 1892, declared that "increased growth of the frontal lobes is the physical accompaniment of intellectual activity."

Hitzig said: "It is true that the intelligence exists in all parts of the cortex, or rather in all parts of the brain, but I hold that abstract thought needs a separate organ, and seek for it in the frontal lobes." He pointed out already in 1874 that the ruin which progressive paralysis, that implacable destroyer of the intellect, produces, is pre-eminently in the cortex of the frontal lobes.

Bianchi found: "The frontal lobes preside over certain higher mental faculties, and are, so to say, a centre for the intellect. They constitute the organs in which the various sensory and motor images deposited in the different centres of the cortex

become co-ordinated and fused. The destruction of this region entails the loss of the anatomical and physiological basis upon which judgment and the reasoning faculties are reared." The monkeys operated upon by Ferrier lost the power of psychical concentration or attention. According to Bianchi, the animals lost much more, namely, the power of recalling the images of previous sensations in commemorative form, and the power of associating these images in abstract synthesis. He observed the same symptoms in the human subject in cases of tumour affecting the anterior portion of the brain.

Ferrier and Bianchi's localisation of the intellect possesses a special interest owing to the fact that it contains a negation, implied if not expressed, which is more important than the affirmation. Hitzig, Bianchi, and Ferrier, whilst they assign an intellectual function to the pre-frontal lobes, deny it to the other regions of the cortex.

S. J. Franz (*Archives of Psychology*, 1907), after training monkeys and cats, destroyed their frontal lobes, when he found that all freshly acquired habits and knowledge were lost; but if any other part of the brain was destroyed, they were not lost. This loss cannot be ascribed to shock, loss of blood, or the anæsthetic, for in the destruction of the other parts they are just the same. If one lobe only was destroyed, the intellectual associations and actions were not lost but retarded. *The emotions and passions were manifested the same as before.*

Meynert has observed that "all forms of dementia, including senile dementia and dementia paralytica, are due to brain atrophy affecting the frontal lobes, whose weight is much reduced, whereas the other lobes are hardly at all involved."

Jastrowitz and Oppenheim noticed in tumours of the frontal lobes dementia with a peculiar cheerful excitement.

Karl Vogt found: "The brain formation of microcephalous idiots does not depend on an arrest of development of the brain equally all over, but chiefly of the frontal lobes."

B. Sachs found: "Large porencephalic defects in the parietal areas are compatible with a tolerable high mental development, whereas a defective development of the frontal lobes leads to complete idiocy even though the remainder of the hemispheres has attained to normal growth."

J. S. Bolton has shown that in dementia the frontal cortex, especially the pre-frontal area, is greatly degenerated, and that in idiots the degrees of mental deficiency correspond with the lack of development of the same region, while the remainder of the brain may be normal. "The pre-frontal region is the region of the cerebrum, which is concerned with the performance of the highest co-ordinating and associational processes of mind." Bolton (in opposition to A. W. Campbell) has found that the pre-frontal area of the brain is of extremely complex structure and of finer architecture than any

other part of the brain. "It is the last region of the cortex cerebri to develop; it possesses the highest associational functions, and is the first to undergo retrogression" (*Journal of Mental Science*, 1904–1906).

Allen Starr, who has studied the mental disturbances following disease of the frontal lobes, gives the summary of twenty-three cases in the *American Journal of Medical Sciences*, 1894. He says: "The form of mental disturbance in lesions of the frontal region does not conform to any type of insanity. It is rather to be described as a loss of self-control and a subsequent change of character. . . . This action of control implies a recognition of the importance of an act in connection with other acts—in a word, it involves judgment and reason, the highest mental qualities. It seems probable that the processes involved in judgment and reason have for their physical basis the frontal lobes; if so, the total destruction of these lobes would reduce man to the state of an idiot, while their partial destruction would be manifested by errors of judgment and reason of a striking character. One of the first manifestations would be a lack of that self-control which is the constant accompaniment of mental action, and which would be shown by an inability to fix the attention, to follow a continuous train of thought, or to conduct intellectual processes. It is this very symptom that was present in one-half of the cases collected. It occurred in all forms of lesions — from injury by foreign bodies, from de-

struction by abscess, from compression and softening due to the pressure of tumours—and therefore cannot be ascribed to any one form of disease. It did not occur in lesions of other parts of the brain."

Charles K. Mills, Professor of Neurology in the University of Pennsylvania, says: "The region of the brain in which focal lesions have produced persistent psychic symptoms has been the pre-frontal lobe. If these lesions are both extensive and deep-seated, disorders of memory, will, attention, comparison, and judgment may be present."

Durante says that lesions of the frontal lobes are always followed by intellectual changes, and that the frontal, especially the pre-frontal region, is the seat of the highest mental powers.

Schuster (*Mental Changes accompanying Brain Tumours*, 1902) states that melancholia and paranoia are hardly ever observed in lesions of the frontal lobes, but mania and dementia are.

Flechsig located in the frontal lobes the anterior association centre of attention, reflection, inhibition. It is concerned with abstract concepts and other complex intellectual processes. He observed the following changes taking place in lesions of the frontal lobes:—

(1) Active apperception ceases.
(2) Logical reasoning becomes defective.
(3) Loss of ethical and æsthetical judgment.
(4) Exaltation.
(5) Loss of self-control.

Some of the observers confound intellect and intelligence, as, for instance, Munk did. He declared that "intelligence" cannot be localised, and we quite agree with him. Intelligence exists in all parts of the cortex; the entire brain is capable of receiving impressions, but it is the front part only that is the instrument for the processes of apperception, induction, deduction, and for the highest capacities and sentiments.

When the reflective faculties are affected, wrong conclusions will be drawn from correct or wrong premises. When the error of judgment arises from a preternatural activity of other mental powers without affection of the intellect, there results correct reasoning from false premises.

Professor Spitzka, the American neurologist, believes that he is able to show that some faculties can be definitely localised, and that taking two men, both of great but of different mental capabilities, not the same but different areas of their brains will preponderate. He supports his contention by reference to his dissection of brains of eminent Americans. He claims to have noticed the difference between one who was "more creative, constructive, philosophic, and brilliant in abstract generalisations," and another who was "a far keener observer, quick at seeing analogies, an excellent systematiser, and had a splendid power of memorising and recalling visual impressions."

In the brain of Cope, a scientist of creative ability,

constructive thinking, and reflective capacity, who never let an opportunity pass to form a hypothesis, which was often confirmed by others, the middle region of the frontal cortex appears to have been highly developed. It is this region, corresponding to the upper part of the forehead, that seems most intimately concerned with powers of induction and deduction, as the following case will show.

Example of loss of induction and deduction, the patient being cured by surgical operation.

William Elder and Alexander Miles (*Lancet*, 1902):—

Patient, a man aged 47, had a tumour of the left pre-frontal lobe exactly under the frontal eminence, which was swollen. As regards the affection of his memory, it appeared to be not so much a blotting out of his past impressions as a want of power of associating memories, of comparing and contrasting them. Loss of power of forming a judgment about anything and loss of attention were prominent symptoms of his mental condition. He could not compare or contrast two things or ideas. His individual memories seemed all right. He recognised objects and friends. His emotional condition was another prominent symptom in his case. He lost the sense of modesty and shame. There was evidently loss of inhibition. *The skull was trephined, the tumour was removed, and the patient's symptoms rapidly disappeared.*

This case should be compared with those cited in the succeeding chapter, where it will be shown that lesions of other parts of the frontal lobes produce

no loss of judgment and reason, but other intellectual deficiencies, which will be explained in detail.

After this array of evidence has been examined by thinking observers, it is to be hoped that we shall hear no more of the intellect being located in the occiput or parietal lobes, but that the hypothesis of the frontal lobes being the seat of the highest intellectual operations will find general acceptance. If our observation is correct, then it is evident that the measure of the absolute volume of a man's brain cannot be taken as an index of his intellectual capacity. It confirms what Professor Karl Pearson, in a paper read before the Royal Society on January 23rd, 1902, has shown, namely, that there is no correlation of intellectual ability with the size of the entire head. Professor C. S. Sherrington has arrived at the same conclusion, which is obvious, for the purely intellectual functions are confined to the frontal, or rather pre-frontal region, which is at best one-third of the entire mass of the brain.

CHAPTER IV

MENTAL SYMPTOMS IN LESIONS OF THE FRONTAL LOBES (*continued*)

THE CENTRES OF PERCEPTION AND SPECIAL MEMORIES

We must distinguish in the act of vision between the mere perception of an object and an intelligent knowledge thereof as to its nature and qualities. The centre of sensation is not necessarily the centre of perception. We must distinguish between acts of pure sensation and the mental acts of symbolic representation. It is a different part of the brain that sees the object to the one that recognises it. In cortical blindness, Nothnagel as long ago as 1882 observed that the power of calling up visual images remained unaffected. Perception is a complex process, and consists not only of the visual impression, but the impression of solidity, form, size, and position, which vision alone would never give without the aid of the other senses. Our various representations, the different impressions made by the senses, would not exist for us without an element which gives them unity and makes

them an object of understanding. Perception is, then, sensation plus intellection. Sense-deceptions, according to this theory, we should explain as a disruption in the connecting link between the actual sensory and the co-ordinating centres. The sensory ideas, whether visual, auditory, tactile, or other, on entering the domain of consciousness, are studied in all their relations to self and the external world. The visual centre may *see* an object, but the perceptive centre *looks* at an object and ascertains its significance and attributes—the concrete or synthetic contemplation of beings—their form, size, weight, colour, order, number, etc. It is not enough, therefore, to ascertain that a patient after injury to his brain can see an object; we must also discover whether he can see all its attributes.

These powers of perception give retentiveness as well, and thus supply the raw material for our practical knowledge. Hence memory is not a single or primitive faculty. If memory were a distinctive power, it would be alike strong for *all* subjects. But as this is not consistent with fact, we are forced to the conclusion that there is no general faculty called memory, but that each faculty has its own power of recalling its impressions. One individual remembers existences, another events, a third recalls with ease a train of reasoning, another musical airs, another the faces he has seen or the scenes he has surveyed, each perhaps weakly remembering some-

thing else of the matters now enumerated. Each of these memories may become lost in injury or disease of the frontal lobes, while the others remain intact and unaffected in the slightest degree. From this we are led to infer that they must possess anatomical independence.

Professor Bianchi, of Naples, found that after destruction of the cortex of the pre-frontal lobes in dogs and monkeys not only were memory, attention, and the judgment impaired, but the animals did not recognise either the places or persons with whom they had been previously familiar.

Goltz found that dogs in whom he had removed the pre-frontal regions of the brain acted differently from normal animals. Very remarkable is the following experiment which he made. "If a bone is thrown to the animal at some distance, it runs to it with great alacrity, but does not have the sense to stop at the right moment and sink its head, so that it runs beyond the mark, as if it had lost the sense of distance. Instead, however, of turning round and looking for the bone in a methodical way, the animal appears to forget what it is after, and runs on regardlessly until the bone is lifted and the animal's attention again attracted to it."

According to Wundt, admittedly an authority on physiological and experimental psychology, perception must take place in a higher centre where all the sensory impressions are co-ordinated—that is, in a

perceptive centre, which he locates in the frontal lobes. From the following pathological cases, which have come under our notice, it would appear as if the orbital convolutions and the lower end of the frontal lobe were the centres of perception and special memories.

Case of loss of sense of form, size, and weight; memory of dates and names:—

E. M. J., a farmer, aged 60, received a kick from a horse on his forehead, crushing in the skull at the root of the nose along the level of the eyebrows, the fracture extending upwards to the middle of the forehead, showing afterwards an unsightly depression at the seat of injury. The patient, who remained in a semi-conscious condition for several weeks after the occurrence, made a gradual recovery, but the following symptoms remained. He was able to walk about and look after his farm affairs, but he found that he had lost interest. It was noticed that he could not learn and observe things as before; that he could not remember dates, names, or even recognise faces and forms as readily as before. He who could formerly guess at distances correctly could no longer measure them with the eye. Form, size, width, and height seemed changed to him. Formerly a good shot, he could not aim at any object now; a bird in the air appearing a long way off, when in fact it would be near or almost directly over him. Nor could he estimate the weight of cattle, dogs, and horses, at which he was naturally clever before the accident. He spoke rationally and was perfectly normal in every other capacity and disposition, except that he had an inclination to

frequent anger without apparent cause. This was the only loss of control that could be ascertained.

Another case that has come under our observation is the following.—Loss of sense of size and weight :—

H. B., aged 55, a tailor, was hit in a quarrel by a billiard ball over the left eye, fracturing the skull over the supra-orbital foramen. After recovering consciousness, he suffered from agonising attacks of supra-orbital neuralgia, for which he was treated. As regards the mental condition, it has to be noted that the patient lost control over his feelings, and for a time was considered insane. He recovered, however, completely and became a normal man but for the loss of the appreciation of size and weight, so that he could no longer cut clothes or fit coats.

Horace M. Abel and W. S. Colman (*British Medical Journal*, 1895).—A case of puncture of the lower frontal part of the brain by the spout of an oil-can, in which there occurred *loss of memory of previous events, of forms, objects, and places* :—

The patient, G. T., a sober, well-conducted railway fireman, aged 36, was brought to the Peterborough Infirmary with the broken end of an oil-feeder protruding from his right cheek, a little behind the angle of the mouth. It was stated that in stepping from the tender on to the footplate of his engine, with the oil-feeder in his hand, he slipped and fell forwards, the spout of the oil-can being driven forcibly into his face. He was then quite senseless, but partially recovered consciousness in a few

minutes. When he was being placed on the stretcher, some one suggested a coat for his head, and he was sensible enough at that time to say that his own coat was on the engine; so that the loss of memory, afterwards so conspicuous, was not then present. He reached the hospital less than an hour after the occurrence of the accident, and was then quite conscious and tried to answer questions. There was no hæmorrhage from the mouth, nose, or ears. The metal spout of the oil-can was firmly fixed in the base of the skull, and required firm traction with forceps to relieve it from the grasp of the bone; and then, owing to its tapering shape, it was easily removed by the fingers. It passed upwards and towards the middle line, and the concavity of the spout was directed from the middle line, the end of the oil-can entering the skull at the inner corner of the right eye, reaching up to the middle of the forehead. No hæmorrhage followed its removal. The wound was cleansed and a simple iodoform dressing applied. There was now marked paralysis on the left side of the face, with inability to close the left eye completely, complete paralysis of the left arm, while the left leg was comparatively little affected. *Mental condition.*—During the first fortnight he was drowsy, and slept heavily, but could be roused to answer questions. His answers were often ludicrously incorrect, but he evidently understood the questions. *He could not recognise his wife* or his old comrades, and he had also *difficulty in recognising common objects* and their uses. Thus on one occasion he drank his own urine from a vessel, under the impression it was water, and several times he got pieces of ice out of his ice-cup, and declared they were sweetmeats. This failure to recognise—that is, to recall previous

mental images for the purpose of comparison with present ones—was strikingly shown by his failure for weeks to recognise a fellow-workman who met with an accident, and was brought into hospital and placed in the bed next to him. But what was most remarkable was that *the whole of his life for twenty years before the accident was wiped out* from his memory. He asserted that he had never worked on the railway, and that he was a farm labourer. He had, however, been on the railway for nearly twenty years, and previous to that had worked on a farm. All memory of the accident was gone, and has never returned. After he left the hospital some previous events did return, but, as will be seen later, after the lapse of a year there were still five years of which he could not remember anything. He was able to leave his bed at the end of eight weeks, and at the end of three months was able to return home with very fair return of power in the leg, but little in the arm. He was kept under observation from time to time. Nearly a year after the accident there was hemiplegia on the left side affecting the arm chiefly, but there was also distinct loss of power in the face and leg. He could walk several miles, but required frequent rests. There was no anæsthesia. The slightest touches were felt, and localisation was perfect. Sensation of pain, heat, and cold was quite normal on this side, and his muscular sense was accurate. On the right side there was no motor paralysis, but there was definite loss of sensation to all forms of stimuli on the right upper eyelid, forehead, and anterior part of the scalp, corresponding with the distribution of the supra-orbital and nasal nerves. There was also complete anæsthesia of the cornea. Taste and smell were unaffected. Vision was normal. On ophthalmoscopic examination

the fundi were found to be quite natural. In all other physical respects the patient was quite healthy. His mental condition was extremely interesting. On the whole he was somewhat indolent and apathetic, and *there was very little control over his emotions.* He laughed or cried at the slightest provocation, and was as likely to do one or the other at any remark made, and the emotional disturbance did not seem to be the expression of any mental pain or pleasure. His irritability of temper was said to have increased, and he was often hasty in his language, although not violent. *Condition of memory.*—There still remained a gap in his memory, although a smaller one than that which existed when he was in the hospital; then there *was entire oblivion of all events for twenty years* prior to the brain injury. At this later period, however, he was able to recall the more striking events of his life up to five years before the accident, after which all remained perfectly blank until about two months afterwards—when he was able to recollect some incidents of his life in hospital; and he could recall his life in general from then to the time of examination, although he could not trust his memory on small matters. This partial return of memory seems to have been in part due to the habit of his "mates" coming in and talking to him of the past, and continually reminding him of occurrences which were likely to have made an impression on him. There was still extreme difficulty in retaining in his memory any passing events. If he went out for a walk by himself, *he was unable to find his way back*, and often *failed to recognise his own house* when he was outside; and there was also frequent *failure to recognise common objects* and their uses, although nothing now occurred so marked as his not re-

cognising the nature of urine and of pieces of ice referred to in an earlier note.

There is thus present in a modified degree the condition described by Hughlings Jackson as "imperception." There was no aphasia at any time, and no difficulty in expressing himself; it seemed to be the ideas that were wanting, and not the words in which to express them. His reasoning processes were fairly orderly, but as, owing to the blanks in his memory, he often argued from false premises, he arrived at ludicrously incorrect conclusions. For example, he occupied one of the houses built by the railway company for their servants, and as he had no recollection of having worked for them for five or six years, he argued that he had no right to be there, and insisted with unnecessary warmth that his wife should pack up and leave the house before they got into trouble for being there. This mental condition went on increasing latterly. At first there was merely failure to remember and recognise, now he assumed action rather impulsively on the strength of such false or imperfect memories.

M. Jastrowitz (*Deutsche medizinische Wochenschrift*, 1887).—Loss of sense of time, memory of places and objects :—

Patient, wife of a major in the army, aged 42, had a syphilitic scar of 3 cm. in length over the glabella, above the root of the nose. Though intellectually quite normal, *she could not distinguish either time or locality, and mistook objects.* The post-mortem examination revealed intermeningeal hæmorrhage *at the anterior root of the superior and middle frontal convolutions.*

Thos. Laycock (*Austral. Med. Journal*, 1893).—Loss of sense of weight and sense of resistance:—

A case of fracture of the base of the skull *just behind the orbits*, there being a fissure about a quarter of an inch in width. The patient, a man aged 29, was treated surgically. Much lacerated and contused brain substance was removed. On recovery *patient had lost the conception of the quality and position of foreign bodies, their weight and resistance*, through the sense of touch.

Robert Sommer (*Zeitschrift für Physiologie der Sinnesorgane*, vol. ii.).—Loss of memory of form and shape:—

A man named Voit, after fracture of the skull, forgot the shape of objects, and, though he could draw well an object before him, made a shapeless blur when the object was withdrawn.

E. v. Bergmann (*Allg. Zeitschrift für Psychiatrie*, vol. vi.).—Loss of memory for objects, for locality, and for names:—

A case of severe injury to the head, followed by loss of consciousness lasting four weeks. Patient had lost memory for objects, localities, and names. He regained the two former, but the loss of the latter was permanent.

J. Wende (*Allg. Zeitschrift für Psychiatrie*, 1905).—Loss of sense of time, locality, and of objects:—

A patient, aged 33, fell off a scaffolding seven feet high, when the right side of his forehead struck an

iron screw and he sustained a wound about 4 cm. in length. He was rendered senseless, but soon recovered consciousness. He subsequently frequently lost control over his temper, and there was absolute *loss of the sense of time, complete failure of self-orientation,* and *inability to notice things.*

Willbrand observed the loss of appreciation of time.

Förster observed the loss of the memory of places (*Archiv für Ophthalmogie*, vol. xxvi.).

Groeunow did the same (*Archiv für Psychiatrie*, vol. xxiii.).

Similar observations by Bjernum, Brill, Cohen, Schnelle, etc.

Dr. Samuelsohn had a case under his charge where, after an apoplectic seizure, the sense of space and light was intact, but where the *colour sense* was utterly extinguished (*Centralblatt für die med. Wissenschaften*, 1882).

Steffen had a similar case, and concludes from it "that in the main central organ, the brain, the centre for the sense of 'space' and for the sense of 'colour' are divided, no matter how near to each other they may be estimated, but there is a special centre for each of these senses" (Graefe's *Archiv*, vol. xxvi.).

We ought to mention also the result of the post-mortem examination of Dr. Dalton, the most famous example of colour-blindness, who had a deficiency in one of the supra-orbital convolutions, according to

the report of the Royal Medical and Chirurgical Society, 1845.

In a paper on "Colour-blindness," contributed to vol. v. of the *Proceedings of the Bristol Naturalists' Society* in 1887, Sir William Ramsay suggested that the particular defect which causes colour-blindness may lie in the brain, not in the eye. Certain persons, as he points out, are incapable of judging which of the two musical tones is the higher, even when they are more than an octave apart. Yet such persons hear either tone perfectly; the defect is not one of deafness. "It must be concluded," says Professor Ramsay, "that in such a case the brain is the defaulter. And it may equally well be the case that the inability to perceive certain colours is not due to a defect in the instrument of sight—the eye, but to the power of interpreting the impression conveyed to the brain by the optic nerve. If this be the case, the problem is no longer a physical one; it falls among those with which the mental physiologist has to deal."

CHAPTER V

MENTAL SYMPTOMS IN LESIONS OF THE FRONTAL LOBES (*continued*)

MEMORY FOR WORDS, FIGURES, AND TONES

THE "speech-centre" is too well known to require confirmation by the author. But we should like to add a few remarks to the recent criticism by Professor Marie, who contends that there is no such thing as Broca's aphasia, by which is meant an inability to speak, due to the destruction of the cortical centre concerned with articular speech. He says that the cases which have been classed as Broca's aphasia have been either simple cases of hæmorrhage into the left corpus striatum, causing hemiplegia and loss of speech, without intellectual disturbance,—a condition which he proposes to call, not aphasia, but anarthria (deprivation of articular speech),—or this condition is complicated by lesions of the island of Reil and Wernicke's area, which are always attended by more or less impairment of intellectual capacity. First of all we should like to point out that as regards the localisation of speech, a study of the earlier cases of aphasia—those published before

Broca's time—by Gall, Bouillaud, Dax, W. A. F. Browne, etc., would throw some light on this controversy. From them it would appear that the speech-centre is probably in the island of Reil, or in its immediate neighbourhood, as Flechsig now assumes, and is a complicated centre. Secondly, as our cases show, there may be deprivation of articular speech, with or without intellectual disturbance, according to the extension of the damage, and there may be simple loss of memory for names only, for objects only, or for both. Moreover, the memory for words may be lost, and the memory for tones (music) or figures—and their expression—may be preserved intact.

MEMORY FOR NUMBERS

Dr. Pringle Morgan (*British Medical Journal*, 1896) has recorded a case in which the memory for words and letters was lost, but not that for figures; from which we must infer that there is not only a complete functional independence of these two faculties, but also an anatomical independence.

K. Rieger showed at a meeting of the Medical Association at Würzburg on 26th February 1887, a patient, Mr. Seybold, a sculptor in Carlstadt, who received a fracture of the base of the frontal bone of the skull in a railway accident. Patient spoke a bit slowly, and was weaker in his memory than before the accident, but the chief symptom was that *he*

had forgotten all ideas of figures beyond 1, 2, *and* 3 (*Centralblatt für Nervenheilkunde*, 1887).

Dr. Volland (*Münchener medizinische Wochenschrift*, 1886).—A case of aphasia with complete retention of the power to express figures in words and writing:—

A farmer's son, aged 15, had a fall which injured the scalp but not the bone. When he recovered consciousness after several days, he understood everything that was said to him, but *could only reply one word "Anna," by speech or in writing.* Yet he was able to count to a 100, to recite the multiplication table, and to add or subtract figures. He could write all figures and calculate correctly on paper. Gradually he acquired the power to speak whole sentences, but did not get on well at school, except in arithmetic, in which he was equal to the best. Six years after the accident he was still somewhat aphasic, had attacks of giddiness and slight ptosis. This case shows that the formation and expression of words must be anatomically separate from the formation and expression of figures.

Schroeder van der Kolk (*The Pathology and Therapeutics of Mental Disease*).—Paraphasia and word-blindness, with preservation of memory for numbers:—

Patient had an apoplectic attack of only short duration, and which left no signs of paralysis behind; yet the memory for words had in a great measure vanished, so that he called objects by wrong names. There was yet another remarkable suppression, such as had never before been observed

The patient was no longer able to read, although the sight was not impaired. On a large printed book being placed before the man, he distinguished the letters in it quite well, and spelt, for example the word "towards," but he was not able to combine these letters into a word. The man had also lost the capability of writing, so that he could no longer sign his name. But the most remarkable circumstance with this patient was that he could still, according to the assurance of his son, keep his ledger and *reckon* now as before.

Dr. Marcé: Case 11 and Case 7 (*Gazette médicale de Paris*, 1856):—

Patient distinguished single letters quite well, but was no longer able to combine them into a word. He transcribed a word quite correctly, but could not write it when it was dictated to him. Yet he could write figures very well.

The other patient could not write his name from memory, but wrote figures and solved complicated arithmetical exercises, always setting the figures in their proper places.

Otto Hebold (*Allg. Zeitschrift für Psychiatrie*, 1894, Case 2):—

H. G., a patient with *loss of speech* who could calculate correctly.

James Shaw published a case of loss of power of calculation in a patient, in whom post-mortem a superficial patch of yellow softening was found, measuring about three-quarters of an inch, where

the third frontal convolution becomes the external orbital (*Brain*, 1892).

Flechsig declared that the third frontal convolution is originally divided into four fields, and that perhaps the *lowest* (*No.* 40) *is the one specially developed in mathematicians.*

When the visual memory for words or figures is lost, it would appear, if our theory is correct, that there is a disruption in the link of association fibres. In mental states of depression and melancholia, which, as we shall see directly, are associated with the parietal lobes, word-blindness is common. In mental states of excitation, which are related to the temporal lobes, as we shall also show, word-deafness is common; yet we rarely get word-deafness with states of depression, or word-blindness with states of excitation. This statement will be made clearer after a perusal of the succeeding chapters. Meanwhile, the following cases may prove of interest:—

Heilly and Chantemesse.—Sensory aphasia in a patient whose power of calculation was preserved. Could play écarté correctly (*Progrès médical*, vol. xi.).

James Hinshelwood (*Lancet*, 1895):—

A man, aged 58, a teacher of French and German. Of recent years he has had a large amount of mental work, and before his present visual difficulties appeared he had considerable mental worry and anxiety. Patient found suddenly one morning that he could not read the exercise as usual. Greatly puzzled, he took up a printed book, and found that he could not read a single word. On

examining his visual acuity, Dr. Hinshelwood found that he was *unable to read even the largest letters* of the test types. He informed him that he could see all the letters plainly and distinctly, but could not say what they were. What attracted special attention was the fact that the patient *read at once the number* standing at the top of each paragraph of the test types. On examining him further, it was found that he did not experience the slightest difficulty in reading any number of figures quite fluently and without making any mistakes whatever. He could read figures printed on the same scale as Jaeger No. 1, the smallest of the test types, and from other tests it was evident that there was no lowering of his visual acuity. The inability to read was thus manifestly not due to any failure of visual power, but to a loss of the visual memory for letters. The page of a printed book appeared to him exactly as it appears to a person who has never learned to read. He saw each individual character distinctly enough, but the character was no longer a visual symbol, as he no longer remembered the special significance attached to it. His difficulty with written characters was equally well marked. He could write with perfect fluency and ease to dictation, although afterwards he could not read what he himself had written. He spoke as fluently as ever. He had loss of the right half of each visual field, but the fundus oculi was normal. Patient was tested further with large combinations of figures, and all these were read with the greatest fluency, and without any hesitation whatever.

A. Chauffard (*Revue de Médecine*, 1881). — Case of sensory aphasia. Had a tendency to substitute

numerals for words. His appreciation for music was well preserved, though he complained that he could not hear words.

Dr. Déjérine had a patient who, although word-blind, could write as fluently as ever. He could copy correctly pages of manuscript, although *he could not read a word* he had written. He had also lost the power of reading musical notes, but he could still sing well. *He could read figures* and do mental calculations just as well as ever. There was right homonymous hemianopsia. Ten days before his death he was suddenly seized with paraphasia and total agraphia (*Comptes rendus des séances de la Société de Biologie*, 1892).

Dr. Brandenburg.—A hitherto healthy man, had an apoplectic stroke, which made him temporarily aphasic. There was alexia but no agraphia; the patient could write anything but could not read, with the exception of figures, so that the reading of numbers was preserved (Graefe's *Archiv für Ophthalmologie*, 1888).

M. Lannois (*Lyon Médical*, May 1898).—A case of complete loss of all form of memory except the memory for figures:—

Patient, aged 32, had been for three years in a condition of complete amnesia, with the exception of the memory for figures. He could not write spontaneously anything except figures, and calculating remained his only occupation.

THE CENTRE FOR THE APPRECIATION OF TONES

The independence of aphasia and amusia is established by the collection of fifty-two cases published by Professor Edgren of Stockholm, of aphasia without amusia, and pure amusia with aphasia (*Deutsche Zeitschrift für Nervenheilkunde*, 1894):—

The same author published in *Hygiea*, 1894, the case of a man who, after knocking his head against a lamp-post, complained of severe headaches, and eight days after the injury developed tone deafness. The patient, an intelligent and musical man, came home and told his wife that he had been unable to make out the melodies played at a place of public amusement. He had been round to several places to test himself. He could only hear indistinct sounds, and was unable to make out any melody; he could not even distinguish between a march and a valse or polka. He remained tone deaf till his death. The post-mortem examination revealed destruction of an area adjoining the commencement of the fissure of Sylvius.

Bouillaud (*Bulletins de l'Académie de médecine*, vol. xxx.):—

A patient, aged 50, who had lost the memory for words almost entirely and could speak and write but very little, yet composed an original tune, watched carefully when it was played to him, and sang the words correctly to the accompaniment.

Professor L. von Frankl-Hochwart has studied the injury to the capacity for musical expression in five

cases of aphasia. In all of these the musical power was less injured than that of speech. Some of them could sing words which they could not speak. Two could play from the music book, one the violin, the other the piano, but they could not sing from it (*Deutsche Zeitschrift für Nervenheilkunde*, 1891).

Dr. Brazier cites some cases in which there was no aphasia, but the patients could not distinguish musical airs with which they were usually familiar.

Professor Oppenheim has published clinical notes of seventeen cases of aphasia in which the musical faculty has been the subject of careful inquiry. The general result of these observations was that the musical faculty survived the loss of speech in aphasia, though in some patients the other mental powers were evidently injured. After the memory for melodies, the memory for numbers was found to be the best preserved.

One patient, though he could not read ordinary letters, could not write to dictation, nor copy writing properly, could quite well read and copy musical notes or write them to dictation (*Charité-Annalen*, 1888).

Dr. G. A. Königsfeld, of Aix-la-Chapelle (*Zeitschrift für Physiologie*, Heidelberg, 1843), records the following case:—

J. Trump, a singer, aged 18, received a kick from a horse, resulting in a fissured fracture of the frontal bone, the fissure running from the outer corner of the left eyebrow upwards along

the border line of forehead and temple. The particles of bone were pressing on the brain, and the brain itself was contused. The wound suppurated, but got well after surgical treatment, a broad, deep scar being left. The patient had not suffered in intelligence after his recovery, but lost the memory of all the tunes he formerly knew.

A. Knoblauch (*Deutsches Archiv für klinische Medizin*, 1888)

cites the case of a little girl, Lizette S., aged 6, who had right hemiplegia with aphasia. The child could not speak at all at first. Later on she said "Mamma," and apparently repeated a few words. She could sing the song "Weisst Du wie viel Sternlein stehen," etc., but she could not recite the text of the song, or speak voluntarily single words of the same.

Dr. Bernard (*De l'Aphasie*, Paris, 1889):—

A lady, music teacher, aged 45, had an apoplectic stroke, became hemiplegic on the right side and aphasic, but recovered the powers of speech gradually, though she now expressed herself with difficulty. Yet she sang the tune "La dame blanche vous regarde" with the correct melody, pronouncing every word distinctly, and other tunes besides. She was not word-deaf. She could read a few sentences from a newspaper. She could read the title of music-scores, yet not the score itself; she could not read a single note. Of all pieces of music put before her she read the title, but failed with the notes. *Post-mortem.*—A long strip of the convolutions within the Fossa Sylvii was found destroyed.

Frank Hay (*Journal of Mental Science*, vol. xli.)

described the case of a patient, an epileptic, who became aphasic. Besides speech, patient, who previously was a musician, had lost the musical faculty. He could not be induced to sing, though formerly a member of a church choir. His humming and whistling was only a monotone, never a tune. *Autopsy.*—The tip of the temporo-sphenoidal lobe was disorganised, and exposed a cavity which entered the fissure of Sylvius, and partly exposed the insula and anterior extremity of the operculum.

A. Kast.—An interesting case of aphasia, with loss of "ear" for music:—

A youth, aged 15, fell from a cart and struck his head against the wheel. The accident was followed by loss of consciousness, which lasted several hours, and on restoration to consciousness it was found that the right side of the body was paralysed, and that, though he seemed to comprehend what was said to him, he could not utter a word. The paralysis slowly disappeared. At the end of two months the aphasia had altered its character. The boy was no longer unable to speak, but he had completely lost the artistic use of his vocal chords, though prior to his accident he was a distinguished member of a choral society. Thus he sang discordantly and quite out of tune, and could not correctly follow the lead of another singer.

Dr. Finkelnburg (*Berliner klinische Wochenschrift*, 1870)

gives the case of a professional violin player, who, after an apoplectic stroke, lost considerably the

memory of names of objects, and more so of abstract ideas. He could still play the violin by ear as ably as before, but not from notes, which he constantly mistook, nor could he write notes any longer without making mistakes. Another stroke deprived him of speech altogether, of the power of writing, and of the ability to read notes. *Post-mortem.*—The cortical layer of the island of Reil and the neighbouring brain parts were softened.

Other important workers on *Amusia* besides those mentioned are: Stumpf, Stricker, G. Ballet, Wallaschek, Brazier, Paul Blocq, Brissaud, Donath, Würtzen, and Marinesco.

The cases quoted show that there are special centres in the frontal lobes for different memories, and that in taking a case, careful examination should be made of the individual mental organisation to ascertain the loss of any special memory or other intellectual capacity.

CHAPTER VI

MENTAL SYMPTOMS IN LESIONS OF THE FRONTAL LOBES (*continued*)

THE HIGHER HUMAN SENTIMENTS

THAT the frontal lobes really represent the higher nature of man is shown in cases of their destruction, when all the stock of inherited and acquired sentiments, in fact man's moral nature, seems to disappear. Every one knows the classical "Crowbar Case" recorded by Dr. Harlow. It is so typical that it cannot be too often quoted:—

While Phineas P. Gage, aged 25, was engaged tamping a blasting charge in a rock with a pointed iron bar, three feet seven inches in length, one inch and a quarter in diameter, and weighing thirteen and a quarter pounds, the charge suddenly exploded. The iron bar, propelled with its pointed end first, entered at the left angle of the patient's jaw, and passed clean through the top of his head, near the sagittal suture in the frontal region, and was picked up at some distance covered with blood and brains. The patient was for the moment stunned, but within an hour after the accident he was able to walk up a long flight of stairs, and give the surgeon an intelligible account of the injury he had sustained.

His life was naturally for a long time despaired of, but he ultimately recovered, and lived twelve years and a half afterwards. This is what Dr. Harlow says as to the patient's mental condition: His contractors, who regarded him as the most efficient and capable foreman in their employ previous to his injury, considered the *change in his mind* so marked that they would not give him his place again. The equilibrium of balance, so to speak, between his intellectual faculties and animal propensities seems to have been destroyed. He is fitful, irreverent, indulging at times in the grossest profanity (which was previously not his custom), manifesting but little deference for his fellows, impatient of restraint or advice when it conflicts with his desires, at times pertinaciously obstinate, yet capricious and vacillating. Devising many plans of future operation, which are no sooner arranged than they are abandoned in turn for others appearing more feasible. *A child in his intellectual capacity and manifestations, he has the animal passions of a strong man.* Previous to his injury, though untrained in the schools, he possessed a well-balanced mind, and was looked upon by those who knew him as a shrewd, smart business man, very energetic and persistent in executing all his plans of operation. In this regard his mind has radically changed, so decidedly that his friends and acquaintances say he is "no longer Gage."

Dr. E. Brown (*Alienist and Neurologist*, 1883) gives a similar history of change of character in a case of traumatism over the same area:—

J. K., aged 39, was a quiet and orderly youth before the injury. He entered the army early in

the American Civil War, and was struck on the head, where the wound left a cicatrix over the junction of the coronal and sagittal sutures. He remained unconscious for twenty-seven hours. On his return home he was found to have undergone a change of character. There was loss of control over his temper, together with religious delusions.

A case of dementia with complete change of character, due to injury of frontal brain-region, was recorded by Dr. Robert Jones in the *Archives of Neurology*, 1907:—

X. Y., aged 26, was admitted to Claybury Asylum from prison. The family history was singularly free from insanity and drink. The patient was in good health and condition, and the organs apparently normal. The diagnosis was "organic" dementia, secondary to injury of the brain, traumatism being the assigned cause of insanity, patient having fallen 40 feet down a lift, and fractured his skull in the pre-frontal region. The forehead showed a linear scar 6 cm. long, with obvious depression of the right frontal bone. Patient was unconscious for several days after the accident, and there was some loss of brain-substance. Six months later some portions of dead bone were removed at St. Bartholomew's Hospital, and after two or three years of medical treatment he was pensioned as unfit for further work in Woolwich Arsenal. Before the accident, patient was bright, energetic, honest and trustworthy, a life abstainer, and much respected. After the accident there was a complete metamorphosis; his career became a record of moral obliquity and mental perversion. He was idle, irritable, threatening, and violent; he was three

times convicted of indecent behaviour, the last time being detained during His Majesty's pleasure, and after being in prison a month was removed to Claybury.

A. Pitres (*Leçons cliniques sur l'Hysterie*, Paris, 1891) found religious hallucinations and delusions in excitation of the same brain area.

The following is a case of what would formerly have been described as "monomania of religion."

A. P. Millar (*Medical and Surgical Journal*, vol. iv.):—

A clergyman who had neglected his health had a sudden outbreak. He had called on a notorious drunkard to convert him to better ways, and was turned out of the house by him. This conduct had such an effect on his already excited feelings that he rushed into the public square, holding his Bible in the air, and knelt down praying to God to subdue the obduracy of the sinner's heart, and rising up began most vociferously to exhort people to repentance, for sin had darkened the land, and the judgments of God were coming upon earth. After much difficulty he was compelled to go home, where he ran up to his bedroom, stripping and washing himself by dashing basins of cold water over his body, and praying most earnestly "that the waters of life he was now washing in would cleanse his soul from all sin." This process he had repeated thrice, and such was the intensity of his conviction respecting his own impurity that each time he determinedly refused to be dressed in the same clothes, because they were unclean. He died twelve days after the event. *Post-mortem.* — Hæmorrhage limited to the upper

end of the superior and middle frontal convolutions, corresponding to the situation of the anterior fontanelle.

James George Davey (*Zöist*, vol. i.):—

E. M., aged 64, suffered from religious insanity, the first sign of which was evinced by a love for theological disputes, which eventually became so excessive that she disturbed religious services by calling the minister to order for the opinions he expressed. She subsequently regarded herself as an apostle, and declared she was an instrument in the hands of the Almighty, with which it was His intention to effect extraordinary and great good. Sacred music sent her into ecstacy, and she sometimes fell into a paroxysm during the service at the Asylum Chapel. *Post-mortem.*—The brain and its membranes were apparently healthy, with the exception of a circumscribed part in the superior frontal convolution corresponding to the anterior fontanelle, where the tissues were so firmly adherent to one another that the membranes were torn in liberating the brain.

H. Schüle (*Sectionsergebnisse bei Geisteskranken*, Leipsic, 1874):—

A labourer, aged 41, received, some twenty years prior to admission, an injury on the top of his head which never caused him any inconvenience though there was a bony deficiency, the size of a florin, $\frac{1}{3}$-inch behind the coronal suture in the middle line, where post-mortem a piece of iron was found embedded, causing degeneration of the brain-substance around. Patient was admitted for mania. Fourteen days after his admission he began the solemn recitation of Biblical sentences with increased excitement,

so that he had to be isolated. *He continued to preach fervently in his cell, and gave Bible quotations with a declamatory voice.* His temperature rose. A cold bath reduced it again, and he then *began the preaching anew*, with a further rise of temperature and quickened pulse. He got generally exhausted by the morning. The fever and the maniacal excitement of a religious character always went together, and no treatment seemed to prove of avail. He died of pneumonia about three months after admission.

John B. Chapin (*American Journal of Insanity*, 1862):—

E., male, aged 23, single, farmer, no hereditary tendency to disease. Hitherto healthy and industrious. Came voluntarily to the asylum. Devoted to religious subjects and religious life, combined with melancholy. Occasionally a reaction of profanity. He replied to questions in monosyllables, and was never able to carry on a conversation. *Post-mortem.* —A tubercular tumour, the size of a walnut, was discovered at the vertex of the brain.

W. A. F. Browne reported a similar case of religious melancholy with softening in the right superior frontal convolution, region of anterior fontanelle.

From these cases it would appear that the substrata of our moral sentiments are to be found high up in the frontal lobes. According to Campbell, however (*Journal of Mental Science*, 1904), "Destruction of what one may call the middle part of the frontal lobe gives rise to various disturbances of the moral faculty."

EUPHORIA AND EXALTATION

A sense of well-being and general optimism are common symptoms in functional disorders and organic lesions of the frontal lobes. They occur in simple "manie," in addition to an increased mental activity, but also in various other forms of insanity, and not merely in general paralysis of the insane. Natural dispositions such as hope, pride, and ambition, in addition to the imagination, are stimulated to an excess; delusions of grandeur and of vanity, of increased wealth, power, and importance may develop, until all the ideas are affected, and chronic dementia is the result.

Exaltations of vanity occur in the chronic alcoholic, and religious exaltation in epileptic insanity.

The following are cases showing the probability of exaltation being due to a limited lesion of the frontal lobes.

Castan and Lejonne (*Revue Neurologique*, 1901):—

A woman, aged 33, was admitted into the Salpetrière with optic neuritis, Jacksonian epilepsy, and a peculiar psychical disturbance. Suffering at the commencement of her illness from apathy and torpor, probably due to cerebral compression, she now passed into a state of high spirits (euphoria), looking happy and smiling when spoken to, complaining no longer, and showing signs of good humour and good appetite. Her intelligence seemed a little blunted, and she laughed at almost everything which was said to her, and exhibited little initiative

or volition of her own. Her recollection of things said to her was poor. Her habits remained neat and clean, and she was free from dementia. A somnolent state succeeded the euphoria, lasting three months. The necropsy revealed a large cystic tumour involving the posterior two-thirds of the ascending frontal convolution.

V. Magnan (*Revue mensuelle de médecine et de chirurgie*, 1878):—

The patient, a butcher, aged 50, showed, a few days before admission, excessive activity in making exalted plans, possessed by an abnormal cheerfulness and optimism. He died the day after admission. *Post-mortem.*—There was a *symmetrical lesion in the middle ⅔ths of each ascending frontal convolution*, the active congestion extending to half the middle and lower frontal convolutions.

The same author reports a case of exaltation, in which post-mortem a tumour was found in the ascending frontal convolution about its middle third (*Ibid.*, 1879).

T. Claye Shaw (*British Medical Journal*, 1891). —Surgical treatment of general paralysis of the insane:—

A man, aged 36, a packer at the Army and Navy Stores, had, when admitted, grandiose delusions, and was impaired in both gait and speech. He was trephined by Mr. Harrison Cripps. The operation was carried out on the right side of the head about the middle of the post-central convolution, and consisted of making two one-inch trephine

holes, about two inches apart, and removing the intermediate bone. There was considerable bulging of the tissues beneath the opening, indicating pressure. The underlying dura mater was removed, and the pia excised. A considerable quantity of fluid drained away, and the opening was then closed by replacement of the skin. Mental improvement followed, the intellect was clearer, patient became coherent, and had no delusions. He died suddenly in convulsions. At the post-mortem examination it was found that the trephine hole was completely filled up by a tough fibrous membrane. On the under surface this membrane was adherent to about the size of a shilling to the cortex in the middle of the *ascending frontal convolution.*

Another similar case by the same author (*Ibid.*, 1891).

Barton and Gayton (*British Medical Journal*, 1891). — Symptoms of exaltation — operation — recovery :—

A woman, aged 39, married, no family. There was a history of a blow on the head received whilst running upstairs, when she knocked her head against the top of the doorway. This spot, which was the seat of very great pain and headache, was selected for the operation, namely, one inch to the right of the middle line, and one inch behind the coronal suture. *Patient had exalted ideas of wealth, delusions as to possessing carriages and horses,* etc. There were no convulsions previous to the operation, but there were two afterwards. A fortnight after she began to improve, and from that time made a steady recovery. The delusions and headache were both cured. Before the operation she wrote badly and

incoherently; after the operation her handwriting improved, and she wrote a reasonable letter. She was discharged.

Marandon de Montyel (*Annales médico-psychologiques*, 1877). — Patient suffering from mania of exaltation (*délire des grandeurs*):—

At the superior part of the ascending frontal convolution, all the meninges were adherent to one another and to the brain, and could not be detached without tearing the grey matter.

Krafft-Ebing (*Traumatic Insanity*, Erlangen, 1868):—

G. B., aged 29, farmer, fell from his carriage on the left parietal bone. He became excitable and indifferent to his friends. At the same time he developed mania of exaltation, which assumed enormous dimensions. His excitability soon diminished, but the delusion of exaltation remained. He died six years after the accident after an apoplectic stroke. The autopsy revealed fracture of the left parietal bone with two sequestræ sticking in the brain substance close to the longitudinal sinus in the ascending frontal convolution. Rest of brain normal.

F. Lallemand (*Recherches anatomico-pathologiques sur l'Encéphale*):—

Jean Bailly, aged 60, after some ill-treatment by soldiers, had several paralytic seizures which passed off. Coincidently his character changed. He developed an excessive "hopefulness," a blind belief in obtaining a considerable fortune, and planned great enterprises. One characteristic deformity was

observed—his mouth was drawn up on the right side. *Post-mortem.*—A tumour was found, the size of a large egg, on the posterior surface of the right frontal lobe.

Alfred Gordon (*Journal of the American Medical Association*, 1907).—Case of euphoria and moria:—

J. M. R., aged 34, indifferent to surroundings. Impossible to hold his attention. Enjoyed his "good looks," repeating the words "pretty" and "handsome." Familiar with strangers and joking with them. Every act and word expressed enchantment. Laughing constantly. Found all food tasting delicious. *Post-mortem.* — Hæmorrhage in white substance of left pre-frontal lobe.

Voisin, the eminent French authority, assumes a similar "centre of exaltation" (*centre de grandeur*) in the same area (*Traité de la Paralysie Générales des Alienés*, Paris, 1879).

Obernier considers exaltation to be one of the symptoms of tumour in the frontal lobe.

Meynert held that in mental derangements in which exaltation forms a prominent symptom the frontal lobe is the affected part, not so in the derangements in which depression is the leading characteristic.

CHAPTER VII

IDIOCY AND THE PRESERVATION OF SPECIAL MEMORIES

CHILDREN are frequently born whose brains are deficient at birth or stop developing at an early age. This deficiency or arrest of development does not usually extend to the whole brain, but affects the frontal lobes chiefly, that is, those parts of the brain the size of which distinguishes the human being from the animal. Hence the intellectual powers are deficient, and there is a lack of control over the emotions and passions, so that they appear more active. To us, for the purpose of this work, the chief point of interest lies in the fact that the deficiency in the frontal lobes is not always uniform, but that there are one or more centres left which may acquire more than usual energy.

Thus memory of tune is a very common faculty among the feeble-minded. They readily acquire simple airs, and rarely forget them.

Esquirol called attention to the fact that even idiots without the power of speech can sing.

Wildermuth (*Allg. Zeitschrift für Psychiatrie,*

1889) estimated that the musical capabilities are well developed in one-third of even badly speaking idiots; and though first-class musicians predominate amongst normal children, second-, third-, and fourth-class musical capacity exists more frequently amongst idiots.

This remarkable relative development of the musical sense in idiots is the more striking on account of the utter absence of any other evidence of artistic taste. A beautiful landscape or a lovely picture is powerless to move them.

America's most remarkable idiot-savant was "Blind Tom," the world's musical prodigy, who, though feeble-minded in other respects, could reproduce musical compositions after hearing them only once.

Dr. Batty Tuke, jun. (*Journal of Mental Science*, 1891), observed that in insanity, too, the musical faculty was often the last one to go. He had two lady patients who, though quite incoherent in speech, played with great accuracy on the piano, the one by ear, the other by reading music, although the latter was quite unable to read a book, and had not dressed herself for twenty years.

Dr. Langdon Down had an idiot boy under his care who could tell the time, besides the words and number, of nearly every hymn in *Hymns Ancient and Modern.*

Another boy under Dr. Down's observation would, if he went to an opera, carry away a recollection

of all the airs, and would hum and sing them correctly.

An idiot-savant's memory is often very acute for special forms, such as remembering dates and past events. Several children under Dr. Down's care have possessed this faculty to an extraordinary degree. One idiot boy never failed to be able to tell the name and address of every confectioner's shop he had visited in London,—and they had been numerous,—and could as readily tell the date of each visit. Another could tell the time of the arrival of all the children at the Institution, and could supply accurate records when needed.

One boy under Dr. Down's care had a very unusual faculty, namely, the perfect appreciation of past or passing time. He was seventeen years of age, and although not understanding the use of a clock face, he could tell the time to a minute at any part of the day and under any circumstances. Dr. Down tried him on numberless occasions, and he always answered with an amount of precision truly remarkable.

The greater number of idiots cannot count three, though among imbeciles are found children wonderfully skilled in the arrangement of figures and in calculations of various sorts.

Dr. Down had under his care a boy about twelve years of age who could multiply any three figures with perfect accuracy and as quickly as he could write the six figures on paper; and yet so low was he

mentally that, although having been for two and a half years in the almost daily habit of seeing Dr. Down and talking to him, he could not tell his name.

A case of phenomenal talent for counting in an imbecile is told by A. Wizel (*Archiv für Psychiatrie*, vol. xxxviii.). The subject of this study, Sabina W., was a woman, twenty-two years of age, who had been for four years an inmate of the Psychiatric Department in the Jewish Hospital at Warsaw. The family had a special gift for music, but none for arithmetic. Up to the sixth year of her life Sabina grew up a healthy and intelligent child. She went to school, and could read, write, and count. At the beginning of her seventh year she was seized with a grave attack of typhus fever, from which she seemed to make a fair recovery, when she was suddenly visited by epileptic attacks, and gradually became imbecile. When she was eleven she was about the level of a child of three. She was admitted to the hospital when she was twenty-two. She was deficient in the power of generalising and gaining abstract ideas. The sense of past time was most inexact. She could not read or write, could not read figures, and talked only upon simple subjects such as engage the attention of young children. She did not care for music. She was dirty in her habits. When she came into the hospital, Dr. Wizel was told that she had a remarkable faculty for arithmetic, being especially good at

multiplication. He found that she could multiply two figures by two, giving the answer almost immediately and with few mistakes. The weakness of imbeciles at counting is so well known that it has been used as a legal test. To teach imbeciles arithmetic is very difficult. Those who are laboriously dragged through addition, multiplication, and subtraction are often arrested by division. Sabina was found to be better at division than at addition and subtraction. She divided 576, 560, and 336 by 16 with astonishing quickness; also 225 and 270 by 15. Considering her performances in multiplication and division, her failures in simple addition and subtraction were remarkable. It was difficult to get Sabina to explain by what mental processes she so rapidly got her answers. Wizel refers to Inaudi and Diamandi, the great calculators, who were examined by the Academy of Sciences in Paris about fifteen years ago. A line of figures, casually suggested by members of the audience, was multiplied by another line of figures and the product given with astonishing rapidity. Inaudi dealt with the numbers as sounds—that is, they had to be repeated to him orally—whereas Diamandi regarded them as "seen" figures.

Dr. Shuttleworth had in his institution a remarkable case of a young man with a history of congenital imbecility who was able, without much mental effort, to give the day of the week corresponding to the day of the month for several years

past and for several years to come. His ready answers were very surprising to strangers.

Dr. E. T. Boland brought before the New England Psychological Society, 11th October 1887, an idiot-savant, a boy named George, sixteen years of age, whose strong point was that he could answer questions as to calendar dates in his past life and for a year or two in the future. He had never learned to read, sight being too defective, even had his capacity permitted. He was an imbecile in every other respect.

MORAL IDIOCY

Besides the intellectual idiots, there are the moral idiots, children born with fair intellects but with an entire absence of the higher moral sentiments, entirely destitute of moral feeling. They are as insensible to the moral relations of life, as deficient in this regard as a person colour-blind is to certain colours, or as one without ear for music is to the finest harmonies of sound. If caught in an immoral or criminal act, they show no repentance. They may perhaps feel and dread the material consequences of crime, but they are deficient in the feeling of moral guilt. They are not lacking in intelligence, but their intelligence is put to bad use. For further details the reader is referred to the chapter on "Criminals."

CONCLUSIONS

The evidence produced in the preceding chapters warrants us in concluding that *the frontal lobes contain the centres for the higher intellectual processes.*

(1) The perception of objects and all their attributes, such as their shape, size, weight, colour, number and order.

(2) The frontal lobes also contain centres which enable us to remember words, places, lapse of time, facts and events, figures and tones.

(3) The frontal lobes contain the association-centres for all the perceptions and memories, giving us the power to compare, to draw deductions and inductions, to judge and to reason. They form the basis of our imagination.

(4) They appear also to be related in some manner to the manifestation of the highest human sentiments, for their destruction does away with all ethical, æsthetical, religious, and other lofty sentiments.

(5) The frontal lobes thus forming the instruments for the manifestation of intellect and morality exercise a controlling influence on the lower feelings and propensities; they are the centres of inhibition.

(6) Stimulation of the frontal lobes gives rise to increased mental activity and to a feeling of well-being, humorous tendency, and exaltation.

CHAPTER VIII

MENTAL SYMPTOMS IN DISEASES OF THE PARIETAL LOBES

INTELLECTUAL functions have from time immemorial been associated with the brain, but not so the feelings. We have just learned that the intellect is related to the front part of the brain, and that stimulation of the frontal cells produces mania (in the sense described), and that softening of the same parts leads to dementia. The conclusion is perfectly natural that the posterior lobes must have functions different to those mentioned; and since we must exclude the intellect, we must assume that they are related to some primary emotions or feelings.

We have shown that the frontal brain is the area for mania and exaltation, and we shall now show that the posterior brain is the area for bodily sensations, for mental states of depression and melancholia. *All causes, moral and physical, which increase the blood-flow in voluntary muscles and thus stimulate the cerebro-spinal or motor system, give rise to joyous, sanguine moods. All those causes which diminish the blood-flow in voluntary muscles and*

cause an increased flow to the viscera, supplied by the ganglionic system of nerves, stimulate the posterior area, and result in states of depression and melancholy. The viscera and the ganglionic nervous system functioning normally give no sensation whatever; it is only when in disorder that they convey impressions, and then only disagreeable ones. The impulses which pass up from the viscera end in pain only; they depress, therefore. Hence joy cannot be connected with visceral sensations; it can only take place when this is abeyant. It is through the connection of the parietal area with the sympathetic nervous system that the region is so closely related with our unconscious vegetative life.

The direct cause of melancholia is anæmia of the brain, but not of the whole brain, only of some part of the cortical substance, induced by vaso-motor spasms. This assumption is corroborated by the fact that the melancholic attack is often accompanied by such signs as pallor or flushing of the face, cold extremities, and præcordial distress.

Owing to the deficient breathing, lung disease is the most common termination of melancholia.

Vaso-motor nerves contract the coats of arteries, and have thus an influence over the process of nutrition of the body; hence it comes that fretting makes thin.

The deficient blood supply may cause the hair to turn grey or fall out.

The blood pressure rises in mental states of

depression. Whereas the average blood pressure in a normal man is 152 mm. Hg., and in cheerful people it falls to 145 or 140 mm. Hg., in anxious patients it rises according to the degree of fear to as much as 180 mm. Hg. The tension of the walls of blood vessels is increased so that they admit only a small quantity of blood from the heart, which has therefore more difficult work to perform, and thus may give rise to the painful sensations in the melancholic state.

A profuse shedding of tears relieves the blood pressure and relieves also the mental state. This is the reason why grief and anxiety can be worked off by a good fit of crying. The absence of any such external manifestation of these emotions gives them a much greater influence upon the course of thought and upon the bodily state of the individual. Those who really "die of grief" are not those who are loud and vehement in their lamentations and weep the most; for their sorrow, however vehement and sincere while it lasts, is commonly transient.

At the same time, we find the functional activity of the muscular system much impaired; there is languor, lassitude, and loss of all sense of energy. An erect figure is never seen in this malady.

The trembling of fear is probably due to the rhythmic action of the sympathetic nervous system on the cerebro-spinal nerves by means of its elaborate connection with the latter.

The cerebro-spinal system is inactive, hence some melancholiacs remain fixed in one attitude; others are restless, but this restlessness is quite different from the maniacal restlessness. The former is restlessness of the involuntary nervous system, the latter of the voluntary or cerebro-spinal nervous system.

Not only is what little movement that takes place done rhythmically, but the words uttered—the expression of their misery—is repeated in a rhythmical manner.

The defect of nutrition is particularly manifest in those parts of the human frame supplied by the sympathetic nervous system. The skin is dry and muddy in appearance, the hair is also dry and harsh, fades in colour, turns grey, and may fall out altogether; the nails grow slowly, digestion proceeds slowly, the bowels are constipated, the body temperature is lowered, the pulse is slowed, and so is practically every bodily process.

Delusions may develop in the course of the illness, but they are never those of increased consequence and welfare.

Whereas insanities in which the cerebro-spinal system is involved — such as acute mania and epileptic insanity—can occur suddenly, melancholia involving the sympathetic system is slow in its onset. The beginnings are usually so slight that they attract no notice, and it is not until the disorder has become fully established that it is

remembered for how long the symptoms have been gradually increasing.

Melancholia is a mental disturbance which involves the emotions only, and not the intellectual processes, except that they become slower. It is characterised by a feeling of misery, which is in excess of what is justified by the circumstances in which the individual is placed; this state of misery causing a deficient state of nutrition and being aggravated by it. *Were melancholia an affection of the entire brain, the intellect would have always to be involved*, whereas we meet every day with melancholiacs who do not exhibit any disorder in their ideas or lesion of the judgment. *It is a morbid condition of the emotional life affecting an area which is not concerned in intellectual processes.*

Simple melancholia is essentially a state of mental pain, a vague feeling of anxiety, gloom, depression, indifference to the ordinary interests of life, and lack of all hope in the future, or positive fear and trepidation. Those who suffer from it labour under an indefinite despondency, which they can neither shake off nor explain. They find no pleasure in anything, nor can they be touched by the misfortunes of others, their own distress being much more intense than all besides. Thus they live in constant solitude and apprehension. The intellect remains intact, but as every exertion augments the distress, such patients avoid all occupation, become inert, indecisive, and brood over their own sadness.

The intelligence is not equal to the task of controlling these gloomy thoughts—the outcome of an anæmic condition of the emotional centres. These emotional centres evolve morbid thoughts and dark misgivings as the products of their impaired condition; and the intellectual and inhibitory centres are no longer equal to restraining their action or controlling their outcomes by a correct estimate of the morbidity of the thoughts so produced. In all forms of melancholia there is some kind of fear or apprehension which shades and modifies the reminiscences of the past, exaggerates dangers, and distorts reality. Thus a just and rational view of life is no longer taken, and suicide is common.

Pure melancholia being an emotional and not an intellectual disease, one is not surprised that Julius Jensen (*Archiv für Psychiatrie*, vol. xx.), who examined 453 brains of insane patients, found that in melancholia the frontal lobes are not involved, just the opposite to general paralysis, and Tigges (*Allgemeine Zeitschrift für Psychiatrie*, 1888) has made the same observations. He says: "In melancholia there is no wasting of the frontal lobes—they retain their weight; in mania there is some loss of weight; in general paralysis the loss is the greatest."

Lockhart Clarke has said: "That the anterior and posterior lobes have different functions is certain, as the convolutions of the cerebral regions have different structure."

According to Bernhard Gudden, the anterior half of the brain is concerned with motion, the posterior half with sensation.

According to Luciani and Seppilli, the fusion of sensory centres takes place in the parietal lobes.

Durante sees in the posterior lobes "the centre for general sensibility," and believes them to be involved in melancholia.

Laycock and Schroeder van der Kolk regarded the anterior lobes as the intellectual region, and the posterior lobes as the area of the emotions. Consequently, there may be emotional disturbances which do not involve the intellectual processes, and there may be intellectual derangement while the emotional centres keep normal.

As evidence that the sympathetic nervous system has some connection with the parietal area, we may mention Eulenburg's experiments on dogs, who by stimulation of this region of the brain produced irritation of the vaso-motor nerves, together with such symptoms as sudden emptying of the bowels, which we frequently observe in fear.

Destruction of the posterior and parietal area in dogs and sheep, according to Goltz and Beatson, causes these animals no longer to be frightened by objects that had caused them terror previous to being experimented upon.

Moleschott noticed that immediately after destroying in pigeons that portion of the brain

corresponding to the left parietal lobes in man, they showed a total imperception of danger.

Ferrier observed that: "The animal whose left angular gyrus was destroyed moved only unwillingly, and when it was obliged to, it ran its head full tilt against everything that came in its way. When both angular gyri were destroyed there was still greater reluctance to move from its position, arising evidently from a sense of insecurity, for the animal paid no attention to threats and grimaces."

Munk also observed "non-perception of threatened danger. The animal made no sign of fear at threatening gestures."

Dr. Heinrich Kisch states as a most characteristic symptom of mental depression a sensation of heat about the parietal bone.

Krafft-Ebing considered melancholia a form of neurosis or psychical neuralgia of the sensory centres of the brain. Undoubtedly, melancholia gives rise to a psychical hyperæsthesia.

Thomsen and Oppenheim (*Archiv für Psychiatrie*, 1884) stated that the sensory anæsthesias form a typical group of symptoms, the most constant being the *bilateral concentric limitation of the visual field.* It is important to observe that in almost every case psychical symptoms are present; most often depression of spirits, feelings of apprehension, and easy excitement to terror.

Aug. Voisin read a paper on "The Suicidal Tendency" to the Academy of Medicine on 8th August

1882, in which he declared that his observations led him to the theory that the particular part of the brain which gave the tendency and impulse to suicide is in the parietal lobes.

There is ample material to prove to us the relation of melancholic states of mind to pathological conditions of the parietal lobes, more particularly of the angular and supra-marginal convolutions. We shall give numerous examples, but to remove any doubt which may obscure the judgment in the testing of these cases, we shall at once explain those exceptions in which lesions have been found in other regions than the parietal.

Every one may call to mind cases of melancholia which were found with lesions of the frontal lobes. How are these to be explained? In the previous chapters it has been shown that the frontal lobes are the centres of the intellect, and as such centres of inhibition of the emotions. In a lesion of the frontal lobes, therefore, the control or inhibitory influence exercisable over the emotions would be lost, and thus naturally active dispositions become morbid. Of course, if the patient is demented as well as melancholic, both parietal and frontal convolutions will be found affected.

Sometimes no lesion may be discoverable, and sometimes the whole brain may apparently be affected. Thus we may find a general anæmia of the brain in melancholic cases owing to inanition. In such inanition-melancholias there prevails an intensi-

fication of the natural characteristics of the patient; there is manifested a hereditary or acquired disposition to a depressed condition.

In all these conditions, only dispositions which are already leading and highly active in the normal state will become morbid. Thus the modest, humble, apprehensive, and conscientious man becomes the melancholiac and self-accuser. Persons who are of selfish and criminal cast of mind do not in their delirious utterances reproach themselves, nor express ideas and sentiments which imply that they are especially troubled about their past conduct. The delusion that they have committed the unpardonable sin afflicts only the meek, humble Christians who cherish ideas of exalted purity, and who long to attain a holiness of life, yet distrust their capacity, wisdom, and self-control, and are thus led to safeguard anxiously their motives, search their hearts for lurking inclinations to sin, and so drift on into the unfathomable abyss of morbid introspection, which naturally ends in insanity. The ungodly, who pursue deliberately lawless, wicked ways, without a pang of regret, are not self-incriminating the moment thought and reason get unrestrained. It is not the dishonest man, the gambler, or the thief who will, while delirious, confess himself guilty of cheating, embezzlement, and financial frauds; but rather the kind-hearted, "Golden Rule" man, who has endeavoured to practise just and upright dealings with

all men, and whose generous promptings often exceed his means of benevolence.

The clinical material here produced shows that the supramarginal and angular gyri are concerned in the production of those morbid psychical and physical states which we collectively term "melancholia," of whatever nature the lesion may be. Frequently the functions which have been assigned to this area by various physiologists and neurologists, such as "psychical blindness," exist with melancholia, particularly in its earlier stages. Such earlier stages, however, do not often come under the observation of alienists, and the neurologist, generally speaking, is not wont to notice the mental changes in the patient; or if he does observe them, he is likely to regard the patient's depression, anxiousness, and morbid fears as the outcome of existing physical trouble and not of the particular lesion of the brain.

Attaching too much significance to the results of animal experiments, neurologists and brain-surgeons have looked for physical symptoms only, and frequently failed to observe the psychical condition. Hence the cases in which large areas of the brain have been destroyed and the patient was reported to have suffered no mental change. On examining the history of such patients, it will invariably be found that the physician or surgeon who made the report took no notice of changes of character in the patient; and if he did notice them, he disregarded them in the

false belief that character-changes have no relation to brain functions.

I am aware, of course, that melancholia is no longer regarded by a great many alienists as an independent psychosis; that it has been shown by George Dreyfus that all of the cases described by Kraepelin and his school as "melancholia simplex," "melancholia agitata," and "depressive Wahnsinn," are in reality cases of manic-depressive insanity. Dreyfus found in a large number of the cases he examined typical circular symptoms. But this only shows that in manic-depressive insanity we have a general affection of the brain, probably of its circulation; and with cases involving the whole brain, or the greater part of it, we are not concerned in this book. Savage has already pointed out in 1887 that melancholia might usher in mania or general paralysis, or be present after an attack of mania as a phase of reaction, but that it is also true—as may be seen by an examination of the cases we are about to quote —that *melancholia may be a complete psychosis in itself.* That, after the disorder has lasted some time, the melancholic state may change into something else, is no proof against our view, since the cause may be in a circulatory disturbance which cannot be strictly limited; and even when it is in the brain itself, it may be of such a character that the mischief cannot remain limited to a particular region for any length of time.

CHAPTER IX

MENTAL SYMPTOMS IN DISEASES OF THE PARIETAL LOBES (*continued*)

THE SURGICAL CURE OF MELANCHOLIA

In order to demonstrate the practical value of this localisation, we shall begin with such cases of melancholia as have been cured by surgical operation.

The following is one of *the author's own* cases (*Lancet*, 1907):—

Patient, aged 39, a doctor of medicine, previously quite healthy, fell from his cycle on his head. He did not think that he had received any marked injury, and did not believe there was any connection between his subsequent illness and the accident. There certainly were no external signs, but soon after the accident he began to suffer from hemicrania so severely that he could not go on with his work. He got depressed, anxious without sufficient cause, accused himself of all sorts of evil deeds without foundation, and made some attempts on his life, so that he had to have a companion to watch him. He consulted various specialists, who advised change of scene; but travelling did him no good. The depression and headache increased, and he also suffered temporarily from word-blindness. He con-

sulted the author six years after the accident, and was then melancholic, emotional, readily weeping, and very suicidal. The right side of the head pained him much, and there was a burning sensation just behind the right parietal eminence. Operation was proposed, which Mr. William Turner carried out. Only when the head was shaved became a scar visible, which extended from the situation of the angular convolution just behind the parietal eminence vertically downwards for about two inches. A semicircular flap was made extending from the ear to the occipital protuberance, and the scar, which was adherent to the bone, was detached. Two trephine openings, one 1 inch and the other $\frac{11}{16}$ inch in diameter, were made and connected with one another. The bone over the gyrus angularis was thickened and ivory-like, without any evidence of diploë, and the dura was attached to the bone. The brain bulged into the wound and did not pulsate, notwithstanding a strong pulse at the time. On incision of the dura a stream of clear fluid escaped. The dura was found thickened, but the brain appeared quite normal. Dura, periosteum, and flap were each closed with stitches, only a small opening being left for drainage for some days. Patient was at once free from pain, and of cheerful, normal disposition, and has remained so ever since.

2nd Case.

G. Mackenzie Bacon (*Journal of Mental Science*, 1881):—

Samuel S., aged 38, joiner by trade, always in good health. Whilst at work a hammer fell from a height of about six feet on his head. He was not unsensed, nor were any serious symptoms

exhibited at the time of the accident; but six months afterwards he found himself unable to attend to his work through giddiness and inability to fix his mind on anything. A year after the accident he complained of severe pain over the stellate and adherent cicatrix on the left parietal bone. He grew morose and talked of suicide. In the following month he made a most determined attempt at suicide, by throwing himself from the staircase at the top of the hospital where he was then an inmate. His life was saved, and he was sent to Fulbourne Lunatic Asylum. An operation was arranged, and Mr. Wherry removed with the trephine, from the seat of the injury, a piece of the parietal bone, and found the dura mater beneath of a deep purple colour, and apparently healthy; it bulged with pulsations into the wound. The portion of the skull removed was three-quarters of an inch in diameter, but had not been fractured. The wound healed rapidly and well, and a month later the patient was lively and cheerful and went to work in the carpenter's shop. Three months after the operation he went back to his old employers. He continued in good health.

3rd Case.

George E. Wherry (*British Medical Journal*, 1883):—

N., an attendant of the Three Counties Asylum, a strong man aged 25, was sitting in an arm-chair, when a powerful lunatic came up from behind, and struck him on the head with a heavy carpenter's mallet. He remained master of his senses, but fainted from loss of blood. There was a compound comminuted depressed fracture of the

right parietal bone, from the parietal eminence to the sagittal suture. He was trephined. The inner table was found more extensively fractured than the outer, the fragments of skull being deeply depressed and the brain bruised. The exfoliated bone was removed. Next day the wounds unfortunately suppurated. The patient, who, previous to the operation, was *merely anxious* about himself, otherwise calm and intelligent, got more depressed and sullen, and in another month was insane. He had a vacant and absent look. More pieces of bone, which had been exfoliated, were removed, after which operation he spoke rationally, and by December recovered sufficiently to engage in farming pursuits.

4th Case.

William MacEwen (*Pyogenic Infective Diseases of the Brain*, 1893):—

J. W., aged 25. Seven weeks prior to admission he fell down the slope of a quarry, his head coming in contact with a projecting stone. In this way he received a small wound at the posterior extremity of the left parietal bone, about an inch from the middle line, which gave him little trouble and was soon healed. About three weeks after the accident he began to experience a dull aching pain, and began to suffer from great mental depression. These symptoms continued until his admission into the hospital, four weeks from the attack. At the operation the periosteum was thick and somewhat inflamed. A stellate fracture of the skull was discovered, with a much depressed and comminuted internal table, and about four drachms of pus escaped. At the centre of the affected area the dura mater was covered by a thick layer of

granulation tissue, while at its circumference this membrane was flocculent. A fortnight after the operation the wound healed. The patient's former mental depression and painful sensations had entirely disappeared. A month after the operation he was dismissed well, and twelve months after dismissal he reported that he was in excellent health and attended to his work regularly.

5th Case.

H. A. Powell (*Surgical Aspect of Traumatic Insanity*, 1893):—

Depressed fracture of the right parietal bone in a girl aged 8. Depression and apathy. Trephined seven years after injury, when fifteen. Became at once bright and cheerful. Under observation two and a half years.

6th Case.

P. Stetter (*Centralblatt für Chirurgie*, 1892):—

Patient, aged 28, received an injury some eleven years before, in consequence of a cart horse, on which he rode, shying at a railway train, and throwing him to the ground. The pole of the cart was driven into the lower part of his right parietal bone, and the depression extended to the parietal eminence. He was carried home unconscious. The wound healed rapidly, but the depression remained. No physical symptoms, but striking psychical changes. Patient shunned all association with men, sat for hours brooding in a corner, had daily paroxysms of weeping, and preferred in the end his bed to getting about. He was trephined and the depressed bone was removed. After the opera-

tion patient joined social life again and became quite normal.

7th Case.

Briggs (*Philadelphia Medical News*, vol. xiv.):—

A similar case of a patient who was successfully operated upon five years after injury.

8th Case.

Daniel Mollière (*Report of the French Surgical Congress*, 1885):—

M. A., aged 40, received an injury in the parietal region, close to the temporal bone, which left a scar of 15 centimetres' length. Patient became melancholic, with paroxysms of agitation at night. The operation revealed an abscess in the brain beneath the seat of injury. On letting out the pus, his recovery was rapid. He soon returned to his occupation, which he followed with his former gaiety of spirits, and the letters with which he reported himself to the physician showed him to have kept well, and in possession of all his faculties.

9th Case.

The same author (*Ibid.*):—

H. X., aged 31, received an injury to his head which left a scar in the right parietal region. He became melancholic. After trephining the skull at the seat of injury he gradually improved, and was discharged two months after the operation, and reported himself two years subsequently as well, and working at his trade.

10th Case.

George W. Cale (*New York Medical Journal*, 1895):—

A carpenter, aged 26, always healthy until receiving a blow on the parietal bone, to the left of the median line, about midway between the fissure of Rolando and the external occipital protuberance. Four years after, he complained of pain at the spot, and became melancholic, sullen, and morose. The depressed bone was elevated. On recovery he was at once cheerful, and undertook again a responsible position.

11th Case.

Boubila and Pantaloni (*Gazette des hôpitaux*, 1892):—

Case of a patient suffering from hallucinations of sight and tendency to suicide, which was cured after lifting up a piece of depressed bone in the posterior parietal region, evidently the result of an injury.

12th Case.

Dr. Fenoglio (*Bologna Rivista Clinica*, 1887):—

Similar case. Operation. Complete mental recovery. An interesting observation was made in this case, namely, that *the symptoms were reproducible by pressure over the trephine hole.*

13th Case.

The same author (*Archiv. di psichiatria*, 1884):—

A young farmer, aged 19, suffered a depressed fracture of the right parietal bone situated between

the parietal eminence and the highest middle point of the temporal crest. The previously merry, cheerful patient fell into a sad and depressed mental condition, which brought him to the asylum five years afterwards, in his twenty-fifth year. He was trepanned, and a splinter of bone, which had indented the brain, was removed. After the operation the patient recovered his former bright nature.

14th Case.

Philippe Rey (*Report of Alienist Congress*, Lyon, 1891):—

Patient, aged 40, was admitted to the St. Pierre Asylum for symptoms of general paralysis, combined with melancholia, distressing delusions, and terrifying hallucinations. There was a depression in the left parietal bone, size 5 c.m., about which no history could be obtained. The depressed bone was elevated, the dura mater excised. The meninges presented a gelatinous appearance with milky spots. After the operation the patient lost his depressing delusions and hallucinations, but not the symptoms of general paralysis. He died later of a diffuse meningo-encephalitis.

15th to 22nd Case.

W. B. Fletcher (*American Journal of Insanity*, 1886 and 1887):—

These are eight cases of patients who, after injury to the skull in the parietal region, which left a depression, were suffering from melancholia, and developed suicidal tendencies, and who after lifting of the depressed tablet of bone became normal men

again. Fletcher remarks that "whereas before the operation all these eight patients were melancholic, suicidal, and four were destructive to their clothing, none were so after trephining."

The same author mentions two other cases with suicidal tendencies from injury to the *frontal* bone, probably contre-coup, hence trephining the depressed portion of bone, over seat of injury, did not improve the patients.

23rd Case.

The same author (*New York Medical Journal*, vol. xliv.):—

Patient, aged 40, had his left parietal bone beaten in, and suffered from melancholia afterwards. Expression of anxiety, hesitating speech, pain on pressure of scar, and later epilepsy. Was operated on thirty-one years after accident. Epilepsy cured and mental improvement.

24th Case.

Koeppe, Halle, a/S (*Deutsches Archiv für klinische Medizin*, vol. xiii.):—

Christian Liese, when 42 years of age, received a blow on the left parietal bone. Three years afterwards he betrayed much abnormal anxiety, developed symptoms of melancholia, and the following year he made two attempts at suicide, one by hanging, and one by cutting his throat. He was sent to the asylum. At the seat of the injury a scar was visible, and a small tumour could be felt. On excision it was found to be a neuroma dolorosum. Patient became bright and cheerful, declaring himself free from

pain, and was discharged. He reported himself some time afterwards as continuing well.

25th Case.

The same author (*Ibid.*):—

C. D., aged 18, received a blow from a stick on the left parietal bone, which caused him great pain. Fourteen days afterwards, when the wound was healed, he became excited with fear, saw danger everywhere, looked anxiously about, sat or lay motionless. He was admitted to the asylum with symptoms of melancholia, and had to be forced to take his food. When moved to speak at all he burst out crying. On the left parietal bone there was a highly tender scar, one inch long, adherent to the bone. The excision of the scar cured the patient, and he was discharged.

26th Case.

J. E. Chambers (*Report of Cosmopolitan Sanatorium*, St. Louis, 1906):—

Policeman, aged 37, sustained a fracture of right parietal protuberance two inches long. Part painful on pressure and caused fainting. Three weeks later he had "melancholia agitata" lasting for $3\frac{1}{2}$ years. At the end of that time he was operated upon with such success that he was able to resume his occupation after ten weeks.

27th Case.

T. Riboli (*Phil. Seb.*, vol. i.):—

Female patient, suffering for four years from melancholia, complained of pains on the right side

of the head. There appeared a swelling the size of a nut on the parietal bone. When it was cut open pus escaped. But it re-formed, and the second time it was cut open by an accidental knock on the head. Then a necrosed particle of bone was discovered underneath. After its removal the melancholia disappeared, and patient having no relapse within a year of the operation, she was discharged.

28th Case.

W. J. Mickle (*Journal of Mental Science*, 1879):—

Soldier, aged 37, with history of syphilis, had periostitis of the right parietal bone, and suffered from melancholia with suicidal tendency. Anti-syphilitic treatment restored the mental condition.

29th Case. No injury.

H. Handford (*British Medical Journal*, 1899):—

A girl, aged 14, got atrophy of both optic nerves. She suffered from headache and melancholia, and had visual hallucinations. There was an osteophite in the right parietal region, which on trephining was seen to have pressed internally. Patient after her operation lost her headache and hallucinations, and became cheerful, and even her sight improved.

30th Case. Melancholia with psychical blindness.

W. MacEwen (*Lancet*, 1888):—

Patient suffering from acute melancholia. There were both psychical blindness and word blindness.

He was trephined and the gyrus angularis exposed. There was a piece of bone embedded in it, which had got detached from the inner table. Patient recovered, and was able to resume his former occupation.

CHAPTER X

MENTAL SYMPTOMS IN DISEASES OF THE PARIETAL LOBES (*continued*)

OTHER CLINICAL MATERIAL FOR THE LOCALISATION OF MELANCHOLIA

Examples of Injuries of Parietal Lobes followed by Melancholia

Case of recovery.

Charles Phelps (*Traumatic Injuries to the Brain*, 1898):—

Patient, aged 30, fell 25 feet from a ship's deck on to a raft alongside. Consciousness was lost for a few moments only. Hæmatoma over right parietal region. After three weeks painful delusions developed. He suffered acute mental anguish, which could have been scarce exceeded had these pure fancies been actual facts. An inclination to weep was manifested both with and without cause. His speech was always coherent. Gradual recovery. Discharged seven months after admission.

Another case of recovery.

Hahn (*Allg. Zeitschrift für Pyschiatrie*, 1892):—

Patient, a little boy, aged 10, was shown at the

55th Meeting of the German Alienists at Breslau. He had received with a cane from his teacher a blow over the left parietal region for a slight offence. Five days after the receipt of the injury patient had a paroxysm of fear accompanied by trembling of all the muscles, painful sensations over the heart, and hallucinations inspiring great fear. He made self-accusations. Two days later came delusions as to his going to be hanged. He regained his perfect mental stability.

One more example of recovery.

M. Gamberini (*Bulletine delle szienze mediche di Torino*, vol. i.):—

A banker, aged 34, with a history of syphilis, fell from a height on to the left parietal bone. He had severe headache subsequently, and epileptiform attacks, first slight, then growing in severity, and frequently his mental state was that of melancholia. His expression was that of sadness and anxiety, and he had a fixed stare. The bone was swollen at the seat of injury. Antisyphilitic treatment not only made the swelling disappear but cured the melancholia and epileptiform attacks.

Another interesting example.

H. A. Powell (*The Surgical Aspect of Traumatic Insanity*, 1893):—

A case is reported by Mr. Gay (Medico-Chirur. Soc. Meeting, 25th November 1879) in which a man received an injury to the parietal region, followed by necrosis. He was for the following five years despondent and suicidally inclined. He was brought into the hospital after an attempt to drown himself.

An additional interest is lent to the case by the fact that he was to have been trephined for the relief of his mental symptoms, but committed suicide in the hospital by cutting his throat before the day of operation. At the necropsy the inner table was found driven in and adherent to the cicatrix through a fissure in the bone. The brain was natural, only slightly depressed under the indented bone. *During life pressure over the cicatrix always caused hallucinations of the same type.*

Other cases :—

1.	J. v. Maschka	*Prager med. Wochenschrift*, 1879.
2.	The same	*Ger. med. Urteile.* Leipzig, 1873.
3.	R. Thomsen	*Charité-Annalen*, vol. xiii.
4.	G. Huguenin	*Krankheiten d. Nervensystems*, 1880.
5.	S. V. Clevenger . . .	*Alienist and Neurologist*, 1888.
6, 7.	Schlager	Cases 3 and 8. *Zeitschrift d. Ges. d. Aerzte z. Wien*, 1857.
8, 9.	P. Schüller	Two cases. *Psychosen nach Kopfverletzungen*, 1882.
10.	H. Demme	*Militärchirur. Studien*, 1864.
11.	Azam	*Archives générales de médecine*, 1881.
12.	L. Bruns	*Neurologisches Centralblatt*, 1889.
13.	Landerer and Lutz . .	"*Christophsbad*" *Asylum Report*, 1878.
14.	E. Sommer	*Zur Casuistik d. Gehirnverletzungen*, 1874.
15.	W. Wagner	Volkmann's *Klinische Vorträge*, 1886.

16, 17.	Thomsen and Oppenheim	*Archiv f. Psychiatrie*, 1884. Two cases with sens. anæsthesia.
18.	L. Löwenfeld	*Ibid.*, 1898.
19.	C. J. Ellefsen	*Norsk. Magaz. f. Laegevidensk*, 1896.
20.	J. F. Gray	*American Journal of Insanity*, 1876.
21.	G. Alder Blumer . . .	*Ibid.*, 1892.
22, 23.	T. S. Clouston. . . .	Two cases. *Journal of Mental Science*, 1872.
24.	W. J. Mickle	*Ibid.*, 1883.
25.	Stolper	*Vierteljahrsschr. f. ger. Med.*, 1897.
26.	Rathmann	*Ibid.*, 1901.
27.	E. Mendel	*Progressive Paralyse*, 1880.
28, 29.	T. C. English	*Lancet*, 1904. Two cases.
30.	C. W. Burr	*Journal of Nerv. and Mental Dis.*, 1898.

Examples of Tumours of Parietal Lobe accompanied by Melancholia

Tumours growing under the parietal eminence—that is, the central parietal area—are accompanied by symptoms of melancholia.

Here is an example.

Sir William Broadbent (*Lancet*, 1874):—

Clara C., aged 36, a widow, earning her bread as a needlewoman, well nourished, but rather pale and having a sad expression. She was particularly intelligent, but greatly distressed, highly nervous, apprehensive, low-spirited, and often gave way and wept. The emotional depression continued till her

death, when two small gummata were found under the parietal eminence, depressing the right supramarginal lobule.

Dr. Bernhard (*Allg. Zeitschrift für Psychiatrie*, 1883):—

The patient was a woman aged 63, who for years had suffered from melancholia and paroxysms of anxiety. No other signs of disease. These paroxysms increased in intensity, and patient made suicidal attempts. She had delusions of having animals in her body and lead in her head, of suffering from softening of the brain, of having no abdomen. The left side of her body she thought was drying up, because she cut her wrist there in one of her suicidal attempts. *Post-mortem.*—The greater part of the left parietal lobe was depressed for about 2 cm. below its level. The depression was caused by a cyst, filled with serum, beneath the dura and adherent to it. There were no entozootic remains to be found therein.

Th. Sarlan (*Allg. Zeitschrift für Psychiatrie*, 1886):—

Patient, aged 31, father of five children, complained of a sensation of pressure in the parietal region, of sleeplessness, restlessness, and fear; he easily wept, was afraid of becoming mentally deranged, and had the delusion of suffering from lues. Against the counsel of his medical advisers, he subjected himself to an inunction-cure. His anxiety and fear continued to increase in intensity, and one day he made an attempt at suicide. Patient wept a good deal, searched his whole life for possible

causes of his misery, and had to be admitted to the asylum, now suffering for five years, for melancholia agitans. The post-mortem examination revealed a sarcomatous tumour of the parietal lobe.

Other examples of tumours are :—

1.	C. v. Monakow . .	*Archiv f. Psychiatrie*, 1881.
2.	T. Zacher	*Ibid.*, 1888. Case 3.
3.	H. Oppenheim . .	*Ibid.*, 1890. Case 9.
4.	L. Manouvrier . .	*Bulletins de la Soc. d'Anthrop.*, 1885.
5.	Marot	*Bulletins de la Soc. anatom.*, 1875.
6.	E. Mendel	*Neurolog. Centralblatt*, 1882.
7.	Stein	*Ibid.*, 1897.
8.	Anton	*Ibid.*, 1900.
9.	Touche	*Ibid.*, 1900.
10.	Crichton-Browne. .	*British Medical Journal*, 1873.
11.	Glyn	*Ibid.*, 1878.
12.	Anderson	*Ibid.*, 1889.
13.	L. Pierce Clark . .	*Journal of Nerv. and Mental Dis.*, 1895.
14.	T. S. Clouston . . .	*Journal of Mental Science*, 1879.
15.	Virchow	*Onkologie*, vol. ii.
16.	P. Rey	*Annales médico-psychologiques*, 1882.
17.	P. Nicol	*West Riding Lunatic Asylum Medical Reports*, 1872.
18, 19.	Gianelli	*Policlinic*, 1897. Cases 7 and 8.

Schuster, who like the author has examined the history of cases of parietal tumours, states in his work (*op. cit.*) "that neither progressive paralysis, nor paranoia, nor mania, ever occur in such cases,

but they are mostly accompanied by 'states of *depression*.'"

Mills (*Philadelphia Medical Journal*, 1901) declared that tumours of the parietal lobes are accompanied by emotional depression.

Examples of Hæmatoma of the Dura Mater in the Parietal Area with Melancholia

Aubanel mentions several cases of sudden shock followed by a raptus sanguinis, where post-mortem hæmorrhage in the parietal area and false membranes were found (*Annales médico-psychologiques*, vol. ii.). Bouillaud and Cruveilhier made similar observations. Also L. F. Calmeil, numerous cases (*Traité des maladies inflammatoires du cerveau*). Also F. Lallemand (*Recherches anatomico-pathologiques sur l'Encéphale*). Also Voisin and Burlureaux (*De la Mélancolie*, Paris, 1880. Cases 4, 39, 51, 59, 65, and 66), of which we give the following example.

Case 4 of localised hæmorrhage.

Auguste Voisin and Ch. Burlureaux (*De la Mélancolie*, Paris, 1880):—

Gr., a woman aged 34. Though she never had any serious illness, she suffered constantly from palpitations of the heart, and several times fainted in the street. Her mental change dated from the bombardment of Paris, when she became much frightened as to the consequences. Her fears received a further stimulus during the days of the

Commune, when she saw the funerals of the victims pass her house, and inquiries were being made after her husband, who had refused to take up arms. For two months her conversation consisted only of one phrase, which expressed her fear. She gave up all interest in her household and her work. Hearing the thunder of cannon one evening, she grew excited, tore her clothes, and attempted suicide by jumping out of the window. After her rescue she refused all nourishment, and being unmanageable, her husband placed her in the hospital. On admission she seemed terribly emaciated. Her face bore the aspect of terror. The physical examination took place with difficulty; both heart and lungs were found normal. Her excitement abated, and she relapsed into a state bordering on catalepsy, had to be fed with the œsophageal tube, and uttered only a few words of terror. *Autopsy.*—There was a small subarachnoid blood cyst over the left parietal lobe. The arachnoid in this region was studded with numerous yellow spots, size of pins' heads, which, on microscopical examination, turned out to be dilated capillaries, filled with hæmatosine granulations, hæmatine crystals, mostly discoloured, and blood globules.

Fröhlich (*Allg. Zeitschrift für Psychiatrie*, 1875):—

C. U., aged 46, wife of a manufacturer, suffered from melancholia. She had been brutally treated by her husband. Her fear and anxiety were intense. She refused all food, considered herself a great sinner, wished herself dead, and made an attempt at suicide. On admission she had delusions of having to die a frightful death, fears of being put in a boiler with seething oil, and of being swallowed

by serpents. Pretending to get a breath of fresh air at the window, she, in an unobserved moment, committed suicide by hanging. The autopsy revealed hæmorrhage under both parietal tuberosities.

Another example.

W. J. Mickle (*Journal of Mental Science*, 1880):—

A soldier, aged 35. He was depressed and apathetic, sat by himself, never spoke unless previously addressed, sighed occasionally, and took no apparent interest in his surroundings. He was suicidal. The expression was one of sadness and misery. The obstinacy of the patient as to the taking of medicine and food was a source of much difficulty. The post-mortem examination revealed a false membrane (the organised remains of hæmorrhage), size of a five-shilling piece, symmetrically placed in both parietal lobes just opposite the parietal eminence, which was eroded.

Other examples are:—

Pliny Earle . . .	*American Journal of Insanity*, vol. ii.
S. G. Webber . . .	*Boston Medical and Surgical Journal*, 1883.
Brie	*Neurologisches Centralblatt*, 1897.
D. J. Cunningham .	*Journal of Anatomy and Physiology*, 1879.
Amelung	*Bericht über das Hofheimer Spital.*
F. C. Hoyt . . .	*Medical Record*, New York, 1892.
R. Arndt	Virchow's *Archiv f. path. Anatomie*, 1871.
Joffé	*Vierteljahrsschrift f. Psychiatrie*, 1867.
Seidlitz	Oppenheim's *Zeitschrift f. d. ges Medizin.*
J. Wigglesworth . .	*Journal of Mental Science*, 1888. Case 11.

P. Rey . . . . . *Annales médico-psychologiques*, vol. viii.
Gairdner, Robertson, and Coats *British Medical Journal*, 1875.
L. Meyer . . . . *Archiv für Psychiatrie*, 1872.
S. Pozzi. . . . . *L'Encéphale*, 1883.

In support of this clinical observation may be quoted the experiment of Kremiansky of St. Petersburg, who produced artificially a pachymeningitis hæmorrhagica circumscripta in the parietal region of dogs, and observed their mental changes. The animals exhibited morbid fear, and refused to take any food.

Melancholic depression occurs also in other pathological conditions of the parietal lobe. Thus the following are

Examples of Softening of the Parietal Lobes accompanied by Melancholia

E. Kundt cites several cases (*Allg. Zeitschrift für Psychiatrie*, 1894), of which the following is an example:—

H. Michael, aged 33, married, always of good humour, changed half a year ago after a sleepless night. Made an attempt to hang himself, but was rescued in time. He gave afterwards utterance to delusions of melancholia. He believed himself a thief, a bad and a lost man. He was starving because, as he thought, his stomach would not hold food, it being so constructed that it

let everything fall through. He died of phthisis. *Post-mortem.* — Pia over the parietal lobe was thick, milky, and the brain substance beneath was atrophic.

Other cases:—

Voisin and Burlureaux	*De la Mélancolie*, Paris, 1880. Cases 7, 29, 57, 60, 69, etc.
J. Luys	Two cases. *L'Encéphale*, 1881.
James Shaw . . .	Two cases. *Brain*, 1882 and 1895.
F. Lallemand . . .	*Recherches anatom.-path. s. l'Encéphale*, vol. ii.
A. Rosenthal . . .	*Centralblatt f. Nervenheilkunde*, 1889.
D. Ferrier	*West Riding Lunatic Asylum Med. Reports*, 1874.
Patrick Nicol . .	*Ibid.*, 1872.
Percy Smith . . .	*Journal of Mental Science*, 1890.
J. Lockhart Clarke.	*British Medical Journal*, 1874.

The next cases are such as have shown symptoms not only of different degrees of melancholia, but in addition the symptoms attributed to the angular and supra-marginal gyri by other observers, namely, *word blindness* and *psychical blindness*, being able to see words and objects, but failing to recognise them, apparently due to a disruption of the connecting link with the perceptive centres, and not only of the perceptive centres, but of all the stored-up memories, in consequence of which such patients lose all interest in life.

The melancholy need not persist; there may be only a sudden strong depressing emotion at the outset, to be followed by "word" or "psychical" blindness.

Here are a few examples:—

J. M. Charcot . . .	*Le Progrès Médical*, 1883.
Cotard	*Archives de neurologie*, 1884.
G. Anton	*Wiener klin. Wochenschrift*, 1889. Symmetrical lesion.
A. Chauffard . . .	*Revue de médecine*, 1881.
C. W. Burr . . .	*Journal of Nervous and Mental Disease*, 1897, and another case, *Ibid.*, 1898.

C. S. Freund (*Archiv für Psychiatrie*, 1889):—

C. S., aged 57, suffering with word blindness and psychical blindness. The mental state is described by Dr. Freund as follows: "However the moods of the patient may vary, one expression predominates over all others, and is perceptible whether the features are at rest or in motion. It is the expression of anxiety. The patient looks helpless and in fear. Patient was very emotional, crying easily without sufficient cause. Even to his own physicians he speaks but little, and that guardedly; only when completely assured of the friendly feeling which the visitor entertains towards him, does his reserve give way, and he then talks as freely as his defect will allow him." *Post-mortem.*—A sarcoma involving the white matter of both parietal lobules was found.

By the same author (*Ibid.*).—A second case of optical aphasia and psychical blindness, in which the cortex was atrophied in that particular locality. It illustrates still better the two functions of psychical blindness and the emotion of fear:—

C. K., 68 years of age. Most noticeable were his constant sighs, groans, and lamentations, without any reason, certainly not from pain. His face and whole demeanour expressed helplessness

and perplexity. His surroundings seemed strange to him. He seemed psychically blind, and he did not know where he was. He did not understand that he was being medically examined, but looked on the physicians as his enemies, against whom he must defend himself. He was in fear to leave his bed, and when he did get out he moved about with the utmost caution. No paresis, however. He sat brooding, a picture of absence of all will-power. After three weeks his weeping, sighing, and moaning still continued.

Symmetrical Atrophy of the Parietal Bones in Melancholic States of Mind

Numerous observers—Larrey, Broca, Virchow, Rokitansky, Maier, Chiari, Féré, George M. Humphry, and others—have been in possession of skulls with symmetrical depressions on both parietal bones. There is also one in the College of Surgeons' Museum in Lincoln's Inn Fields. They have described the "naked eye" and "minute" anatomy of these deformities, but were unable to discover the cause.

These parietal depressions commonly exist on the two sides and are symmetrical in position, and more or less so in size. They are some distance on each side of the sagittal suture, if not on the parietal tuberosity itself. The thinning is sometimes so considerable as to produce a hole in the centre. These depressions do not present any indication of being the result of disease, such as syphilis, as

Rokitansky has assumed. They are certainly not the result of external influences or accident. Changes in the circulation alone would not cause in the part such a circumscribed symmetrical wasting. These depressions are not congenital, as Humphry thought, nor is Maier correct in attributing the circumscribed thinning of the skull to senile atrophy.

The author finds that in those authenticated cases in which a clinical history was obtainable, such history was invariably one of psychical pain and melancholia, and that it is therefore evident that these localised changes in the skull bones are due to trophic influences.

Here is an example.

Rudolf Bloch (*Prager medizinische Wochenschrift*, 1897):—

Patient, aged 86, had a round depression of 4½ cm. diameter on each side of the parietal bone. Patient was in a condition of mental depression and bore the indicia of anxiety. She was tremulous, slow of speech, and hesitating in her answers, and wrung her hands despairingly. Her intellect was quite normal. History of suicides in her family. Two weeks before admission she had made some attempts at suicide, trying to knock her skull in with a hammer, showing still an open wound, and a day later she used a knife, but was just stopped in time. Later on it was ascertained that she had been in the same institution some thirty years before, and on looking up the case-book it was discovered that she was then treated for symptoms of fear and depression and for boring pains in her head, and

that she then shortly before her admission had made four attempts at suicide, two by drowning, one with a pocket-knife, and one with a razor. *Post-mortem.*—The examination of her skull showed that in the thinned cranial parts the lamina externa and diploë were completely absent. The lamina vitrea appeared unchanged, and at the borders of the depression the diploë was heaped up and there was hyperostosis of the lamina externa.

Another example.

Ludwig Meyer (*Archiv für Psychiatrie.* Berlin, 1872):—

C. Th., aged 44, single, became melancholic in his 41st year, it is said through *disappointment in love.* Hypochondriacal delusions of changes in his own body, effected by women. Repeated paroxysms of fear, with a tendency to self-mutilation—one attempt, cutting his veins in neck and at wrist, nearly caused his death. On admission he wailed and moaned over his supposed misery. Had attacks of acute fear. The autopsy revealed atrophy of both parietal eminences.

Rossbach at the German Psychiatric Congress in 1889 showed a patient, aged 49, who had suffered from melancholia for twenty-five years, with symmetrical atrophy of both parietal bones, and he published the history of two more cases in the *Deutsches Archiv für klinische Medizin*, 1890.

Other cases are:—

H. Schüle . . . Case 1. *Sektionsergebnisse bei Geisteskranken*, 1874.

R. Virchow . . . *Verh. d. phys.-med. Ges. zu Würzburg*, vol. iv.

W. B. Pritchard . *Journal of Nervous and Mental Disease*, 1890.
H. Voppel . . . *Allg. Zeitschr. f. Psychiatrie*, vol. xiv. Case 39.
W. Fränkel . . . *Ibid.*, 1877.
Kirchhoff . . . . *Ibid.*, 1883.

Sometimes we find in melancholiacs other changes in the parietal bones, such as an abnormal expansion of the same. The author has seen several such cases, but they are rarely mentioned in medical literature. Esquirol in his work on *Mental Diseases* mentioned some, and also M. Rivet (*Bulletins de la Société anatomique*, vol. ii.). Voppel (*Allg. Zeitschrift für Psychiatrie*, vol. xiv.) recorded four such cases, and M. Rivet (*Bulletins de la Société anatomique de Paris*, 1887) mentions the case of a melancholiac with suicidal tendency whose parietal bones were of extraordinary expansion and thickness, and whose brain was flattened in this region.

In conclusion of this chapter we must mention Professor Flechsig's observation of Beethoven's skull, which he found extraordinarily developed in the central parietal region. From this solitary fact in so eminent a musical composer, he jumped to the conclusion that a high development of the underlying brain—namely, the supra-marginal convolutions—was one of the essential factors of musical ability. Quite apart from the numerous clinical observations of amusia, or loss of musical ability, made by Kast, Oppenheim, Hochwart, in a quite different locality,

we can show Flechsig to be in error, for Beethoven's parietal development was in harmony with his natural character according to the theory we have advanced. As a youth he was often morose, preferring solitude, and was distrustful of others. He became worse as he grew older, and we have an excellent testimony of his melancholic state in the following words quoted from his last will: "For me there cannot be any recreation in human company. I must live like an exile. If I get near company a burning anxiety overtakes me. Moral power alone has uplifted me in my misery. To it do I owe, in addition to my art, the fact that I have not finished my life by committing suicide." (See Schindler's Biography.)

CHAPTER XI

MENTAL SYMPTOMS IN DISEASES OF THE TEMPORAL LOBES

HUNGER AND THIRST CENTRES

THE temporal lobes of the brain we have in common with animals; in fact, they are relatively of larger size in the lower creation, especially in carnivorous animals. On that ground alone we should be led to assume that they contain the centres for some of the most important instincts of self-preservation. The most elementary instinctive impulse of animal nature is the impulse to satisfy hunger and thirst. The substrata of the feeling of hunger and appetite for food are the stomachic branches of the vagus and their cerebral centres; and as local conditions of the stomach may destroy or increase the feeling of hunger, so central disease may give rise to ravenous appetite or sitophobia, conditions exemplified in certain forms of insanity.

Ferrier has located this centre at the anterior tip of the temporal lobe, in close relation to the olfactory centre. He says: "It was noted in

connection with electrical irritation of the lower extremity of the temporo-sphenoidal convolution in the monkey, and of the same region in the brain of the cat, that movements of the lips, tongue, cheek-pouches, and jaws were occasionally induced — phenomena which might be regarded as indications of the excitation of gustatory sensation. This interpretation receives support from the results of destructive lesions, and we have therefore reasonable ground for concluding that the gustatory centres are situated at the lower extremity of the temporo-sphenoidal lobes, in close relation with those of smell."

In lesions of the temporal lobe, the desire for food is often exalted to a high degree. Bulimia, or voracious hunger, as this form of affection is called, shows itself by an irresistible longing for food of a normal kind, so that an exaggerated form of gluttony results. This may occur when the stomach is enlarged or when it is of normal size. Under either condition the person devours an enormous quantity at each meal—as much, indeed, as would suffice for three or four ordinary men, and yet he may be haggard and gaunt in the extreme.

Dipsomania signifies a disordered cerebral condition, in which the individual madly drinks to excess, yet may loathe the degrading stimulant.

Amongst the insane, bulimia is common; some, having devoured their own ample allowance, seize

upon all they can lay hands on, prowling about the entire day in search of food.

The general paralytic is ravenous, but it is in sight of food, and he does not go about incessantly craving aliment, as some lunatics do, in whom there are no indications of intellectual impairment, but in whom the centres of this appetite are probably irritated. Epileptics frequently show symptoms of bulimia (see Féré on "La faim-valle epileptique," *Revue de médecine*, 1899). Finally, the desire for food may be directed to strange substances, as often happens to pregnant women. In the insane this perversion of appetite will sometimes be so great as to induce them to eat straw, earth, worms, and even their own filth.

The following are examples of abnormal thirst due to a limited lesion of the brain.

Wernicke and Friedländer (*Fortschritte der Medizin*, 1883):—

A case of gummatous softening of both temporo-sphenoidal lobes. Patient *suffered with thirst* so excessively that she drank water by the bucket.

Nothnagel (Virchow's *Archiv*, 1887):—

A man, aged 35, in consequence of a kick by a horse, fell and came down with his right ear against a piece of wood. He was stunned and unable to rise. Half an hour later he felt great thirst, and drank more than 5 pints in the next three hours, before admission to the hospital. He was

still suffering from thirst a fortnight after the accident, when he left the hospital at his own request. The accident occurred between seven and eight o'clock in the evening, and he first passed water after it about eleven o'clock, having already drunk 5 pints of fluid. Next day he drank 21½ pints, the day after 32½ pints; on the seventh day 28 pints, on the eleventh day 30½ pints. A few days later, when he left the hospital, his average had fallen to 9 pints. There was no dryness of the mouth or fauces, and the skin acted freely. The urine was always clear, pale, acid, free from sugar or albumen.

Other cases of both abnormal hunger and thirst, in which there was a lesion of the anterior extremity of the temporal lobes:—

1. H. Schüle . . . *Sectionsergebnisse bei Geisteskranken.* Case 5. (Gumma.) 1874.
2. Krafft-Ebing . . *Über die durch Gehirnerschütterung und Kopfverletzung hervorgerufenen psychischen Krankheiten,* 1868. Case 2.
3. Landerer and Lutz *"Christophsbad" Asylum Report,* 1878. Case 26.

4, 5. H. Voppel . . . *Allg. Zeitschrift f. Psychiatrie,* vol. xiv. Cases 2 and 15.

6. N. Friedreich . . *On Intracranial Tumours,* 1853.
7. G. Spies . . . . *Zur Casuistik der traumatischen Manie,* 1869.
8. Rosenthal . . . *Über Magen Neurosen,* 1886.
9. E. F. Brodie . . *American Practitioner,* 1880 (Bullet wound).
10. C. P. Johnson . . *American Journal of Insanity,* 1858.

11.	Monro	*Morbid Anatomy of the Gullet, Stomach, etc.*
12.	Mortimer . . .	*Philosophical Transactions*, vol. xliii.
13.	Kenneth M'Leod .	*Journal of Mental Science*, 1861.
14.	Percy and Laurent	*Dictionaire des Sciences Médicales :* article, "Homophage."
15.	Editor	*Annales de la Médecine physiologique*, 1832.
16.	„	*Archives générales de médecine*, 1860.
17.	F. Lallemand . .	*Recherches anat.-path. sur l'Encéphale*, 1830.
18.	M. Falret . . .	*Bulletins de la Société anatomique de Paris*, 1866.
19.	Bleynie	*Dissertation sur l'Inflammation du Cerveau.*
20.	Baudin	*Revue générale de médecine*, 1860.
21.	S. W. D. Williams	*Ibid.*, 1869.
22.	B. B. Fox . . .	*Ibid.*, 1891. Case 2.
23.	W. J. Mickle . .	*Ibid.*, 1885. Case 2.
24.	Descuret	*Lancet*, 1837.
25.	Putawski . . .	*Ibid.*, 1890.
26.	Thomas Smith . .	*Lancet*, 1879.
27.	„ .	*British Medical Journal*, 1897.
28.	E. G. Levinge . .	*Ibid.*, 1878.
29.	Crichton-Browne .	*Ibid.*, 1873.
30.	F. C. Wallis . .	*Ibid.*, 1897.
31.	Kingston Fowler .	*Ibid.*, 1897.
32, 33.	Stephen Paget . .	*Transactions of the Clinical Society*, 1897. (Two cases.)
34.	W. H. Bennett . .	*Transactions of the Clinical Society*, 1897.
35, 36.	Sir Thomas Smith	*Transactions of the Clinical Society*, 1897. (Two cases.)

CHAPTER XII

MENTAL SYMPTOMS IN DISEASES OF THE TEMPORAL LOBES (*continued*)

THE SURGICAL CURE OF FURIOUS AND HOMICIDAL MANIA

THE most fundamental instinct of animal and man is the preservation of self. In order to maintain existence, we must destroy or kill for food, and must be able to remove the dangers by which we are surrounded. In order to overcome obstacles, or to fight, great energy is needed. This energy is produced by the sight of the obstacle or foe which rouses us to anger or rage, whereby the strength of every muscle of the body is exalted; a reflex mechanism of immense preservative value in the struggle for existence. In civilised human beings this tendency manifests itself in a refined manner: for whereas primitive man resembled the animal in having to destroy and enter into combat to obtain the food necessary for life, in our own day, money, by reason of its purchasing power, has become the protector of life; and secondly,

because the passions and instincts are nowadays more under the control of the understanding.

Irascibility or anger is the active form of this instinct for self-preservation. It gives an impulse to inflict injury on the cause of the emotion. Anything that produces discomfort in us is likely to make us angry. Hence hunger causes irritability.

By "irascible insanity" or "mania furiosa" is implied that form of mental derangement which is characterised by ungovernable spontaneous motor impulses and *violent anger*, with or without loss of knowledge of the surroundings, and at the basis whereof lies the emotion of irascibility.

This derangement differs from simple mania. As already explained, Germans distinguish the two states by calling the one "Manie," and the other "Tobsucht." Simple mania is the exact opposite to simple melancholia, and its symptoms consist of exuberant joy, excessive hilarity, and an overflow of spirits in generous impulses. There may be great mental and motor activity, but not with a destructive intent. The three types of insanity—simple or hilarious mania ("Manie"), violent mania ("Tobsucht"), and melancholia, are morbid forms of three emotional states, namely, cheerfulness, anger, and fear.

Irascible insanity is a form of mental disturbance in which the prevailing symptom is anger. The patient may be so furious as to exhaust himself in shouts, threats, and actions, or his passion may

be less vehement, but in all cases it is "anger," whether it be spread out thin or thick. It is not the harmless restlessness of the hilarious maniac, nor the restlessness of the anxious melancholiac, but an ungovernable intense excitement when fully established, a wild paroxysm with a blind desire of destruction. His anger and violence manifest themselves in their greatest intensity by shrieking, roaring, raging, and abusive utterances; and he may even, if he gets the chance, commit a murder.

It will be seen from several hundred examples that when the temporal lobe, more particularly at its base, is stimulated, states of excitement are produced. When Ferrier excited this region in cats and jackals, "the application of the electrodes in this region caused the animal to make a sudden spring or bound forward, pricking up both ears, as if preparing to fight, and opening of the mouth, associated with vocalisation and other signs of emotional expression such as spitting and lashing the tail as if in rage."

Excitation of this area in man produces irascibility, from the simple form of anger to furious and even homicidal mania. When the tendency to irascibility is innate, there need be no temporal lesion, but injury or disease of the frontal lobes may, owing to the loss of control, give it exaggerated activity. But we have not come across a single case of irascibility with disease limited to the parietal lobe,

except that form of melancholia called "agitated" melancholia, just as we have found not a single case of melancholia in which the disease was limited to the temporal lobes. With the agitation caused by delusions of persecution we shall deal later.

The evidence of the temporal lobe being in some way the centre of a reflex mechanism for the protection of self by states of excitement which give additional energy to the entire body, is overwhelming.

This part of the brain lies directly over the ear, and can therefore be irritated by extension of ear disease.

Whereas sudden loss of sight may be accompanied by melancholia, affections of hearing lead to various degrees of excitement and mania. If in the latter case there are depression and paroxysms of fear, they are more likely to lead to sudden outbursts and attempts at self-destruction.

The following are examples of successful treatment.

Case of my own:—

Young girl, only fifteen years of age, had regular fits of mania, in which she destroyed whatever she could lay her hands upon, threw the furniture about, tore her younger sister's hair out, and tried to stab her eyes when unobserved. When free from attacks she was a modest, quiet girl. She suffered from middle-ear trouble, and on evacuation of the pus she got perfectly well.

2nd Case.

Ludwig Meyer (*Deutsche Klinik*, vol. vii.):—

T., aged 45, changed in character about two years previous to his admission. Always of cheerful temper, amiable towards his family, peace-loving and sociable, he grew irascible, kept in ill-humour for days together, and was often violent and dangerous to those about him, and the strait-jacket had to be applied to him frequently. A few days after admission a putrid discharge from the ear was noticed, and simultaneously his mania furiosa ceased. Two months later the discharge stopped, and then his fury recommenced, so that he had to be isolated. In three days' time the discharge reappeared, and upon its appearance the mental excitement diminished and ultimately gave way. This repeated itself so often that the attendants began to regard the otorrhœa as a barometer of the mental state of the patient. One day, however, the discharge ceased without any signs of mental excitement, but it was observed that the pus had made its way to the mastoid cells, where a tumour could now be seen. On incision, and subsequent proper treatment, patient was cured of his ear trouble, and with it of his mental derangement.

3rd Case.

Koeppe (*Archiv für Ohrenheilkunde*, 1875. Case 2):—

Hoffmann, bricklayer, sustained in his 49th year several injuries to his left ear. Gradually he got irascible, quarrelsome, and dangerous to his wife and children, with whom he had lived on happy

terms previously. On treatment of the ear-disease he recovered his sanity.

4th Case.

B. Ball (*L'Encéphale*, 1881):—

Patient, aged 22, received a blow on left ear when 13 years of age, which was followed by perforation of the tympanic membrane with putric discharge, also noises in the ear. He sought treatment on account of his uncontrollable paroxysms of anger. Later he also heard voices of an insulting character. The otitis media was treated, and with it the mental symptoms gradually disappeared.

5th Case.

W. S. Bryant (*Journal of Nervous and Mental Disease*, 1906):—

A child, aged 5, who had recurrent purulent inflammation of both tympani, had—whenever there was retention of pus — maniacal attacks, during which she made inarticulate cries, broke everything within reach, and fought desperately with all the members of the family, including those she was most fond of at other times. Drainage of the pus cured the patient.

Other cases of cure of maniacal excitement after treatment of ear disease are:—

6.	W. Rhys Williams	*Lancet*, 1877.
7–9.	H. Schüle . . .	*Handbuch der Geisteskrankheiten*, 1878. (Three cases.)
10, 11.	G. C. Bablett . .	Cases 3 and 4. *American Journal of Insanity*, 1877.

12. J. O. Green . . *Boston Medical and Surgical Journal*, 1905.
13. Watson Cheyne *British Medical Journal*, 1890.
14. Francis Skae . *Edinburgh Medical Journal*, vol. xi.

The following are cases *not due to ear disease*, yet equally successfully treated.

Case 15. From notes supplied by Professor Wanscher, Professor of Surgery in the University of Copenhagen:—

A boy of 16, who, notwithstanding his youth, was a regular bully and terror to his family, and although intelligent, had to be watched constantly to keep him from destroying things, thrashing his fellow-pupils, throwing stones at people, and behaving at times like a maniac. He could not remain still in one place, shouted abusive and foul words, and grew more dangerous as time went on. There was a history of a neglected head-injury at the age of five, thought little of at the time, and the site of which could not be indicated. On the theory advanced by the author, an incision was made in the temporal region of three inches length vertically down to each ear, when the tissues above the left ear revealed the signs of former injury. They were adherent to the bone, and when detached and pushed aside, a trephine opening was made in the skull and the bulging membrane incised, when clear fluid spurted from the opening. The brain itself appeared healthy, and the wound healed normally. The patient got gradually better and behaved properly, did not disturb or insult anybody, showed no inclination for breakage or destruction —in fact, he lost his bad propensities.

Case 16.

Herbert A. Powell (*The Surgical Aspect of Traumatic Insanity*, 1893. Case 1):—

Dr. Powell relates a case (*Pacific Medical and Surgical Journal*, 1884) of a Swedish man, aged 35, who was in the Arizona Penitentiary for a term of four years for manslaughter. The medical officer—Dr. Price—saw him first in January 1883, and found him in a state of *wild mania*. He could get no history of the man, but was told that he had been admitted in this condition. On examining him, he found a depression covered by a cicatrix above and rather behind the ear. No history of the cause of this depression was forthcoming from the man. After an attack of small-pox in February of the same year, he grew worse. On 24th March 1884 he was trephined as a last resource, and depressed bone $2\frac{1}{8} \times \frac{7}{8}$ inches in area was removed. Shortly after his recovery from the anæsthetic, he said in English, "I'm hungry—I want something to eat." It was not before known that he could speak English. Food was given, and taken with relish. He talked quite rationally with his attendants and seemed cheerful. Twelve days after the operation he gave his own history. He was working in a mine in May 1880, and some falling stones fractured his skull. Seven small pieces of bone were removed at the time. When the wound was nearly healed he left off attending his doctor. Afterwards he had a very confused idea of events, not understanding his incarceration in prison. Apparently the committal of manslaughter followed this period.

Case 17. Epilepsy and mania cured by operation.

W. B. Fletcher (*American Journal of Insanity*, 1887. Case 6):—

C. E., aged 37, was struck on the head when thirteen years old with a small wagon wheel; had epilepsy when twenty years old, and married at twenty-two years. In a fit of frenzy he killed his two-year-old child by catching hold of its feet and beating its brains out. Admitted to the hospital at the age of thirty, he continued violent and homicidal. Trephined. The convulsive fits and mania cured. Six months after his discharge still well.

Case 18.

Daniel Mollière (*Lyon médical*, 1881):—

Patient, aged 41, was admitted on account of maniacal furor. His roarings terrified his companions. On examining the head, a slight wound was found in the left temporal region, just above the external auditory meatus. On probing it, a fracture of bone beneath was detected. Patient was trepanned, and pus was found beneath the dura mater. Two days later he recognised his friends, made sensible inquiries, and after a month left the hospital a normal man. He reported himself three months later perfectly well.

Case 19.

E. K. Hoffmann (*Deutsche medizinische Wochenschrift*, 1881):—

A man, aged 50, was struck by a heavy board falling from a great height on to his head. He lost

consciousness and became delirious. Afterwards he had attacks of furious mania, in which he caused tremendous destruction in his household, so that he had to be removed to the asylum. He complained of pain in the head. He had no convulsions or any motor or sensory symptoms. On the right side of the head, a little above and behind the external opening of the ear, was found a small but tender depression of bone, about the size of a shilling, which was resected, when on incision of the dura four spoonfuls of cerebro-spinal fluid streamed out. The pia was turbid and œdematous, and more fluid escaped therefrom. The wound healed well. No further attacks of destructive mania—in fact, no psychical symptoms of any kind. Discharged cured, and reported himself six months afterwards as perfectly well.

Case 20.

James Howden (*Journal of Mental Science*, 1875):—

J. S., aged 51, received an injury to his head, and became insane. He was restless, raging, and dangerous to others, and so remained until the forming of a large abscess in the left temporal fossa, which was opened, when he became sane again.

Case 21.

P. Guder (*Die Geistesstörungen nach Kopfverletzungen*, 1886. Case 7):—

Periodical attacks of violent mania. Two long scars across temporal bone. Operation. Recovery.

Case 22.

Ernst Sommer (*Zur Casuistik der Gehirnverletzungen*, 1874. Case 2):—

A coachman, aged 25, fell from a ladder and fractured his right temporal bone; hæmorrhage from right ear. The temporal arch was much swollen. Patient became acutely maniacal and had to be isolated. An abscess formed over the left ear. After surgical intervention and removal of necrosed pieces of bone, he recovered.

Case 23.

E. v. Bergmann (Volkmann's *Hefte*, No. 190):—

A. H., aged 39, fell from a scaffolding about six yards high. The only marks of injury were on the right side of the head just above the ear. Patient was so excitable and restless that he had to be restrained. He recovered after surgical treatment.

Case 24.

Estlander (*Finiska Läk Handlingar*):—

Boy, aged 13, with violent mania after injury to temporal bone. Operation. Recovery.

Case 25.

A. Spanbock (*Neurologisches Centralblatt*, 1895):—

Boy, aged 14, violent and destructive. Injury in infancy. Operation. Recovery.

Case 26.

Savory (*British Medical Journal*, 1869):—

J. B., aged 22, a brakesman on the underground railway, was found lying across the line by the guard

of another train. When admitted he was quite unconscious. There was a slight wound behind the left ear. There was grinding of the teeth. The right temple was swollen. He became so violent that he had to be strapped down. He was noisy and used obscene language. Discharged six weeks after the accident cured. He had no recollection of it.

Case 27. Operative cure *twenty-five years* after accident.

Pantaloni (*Gazette des hôpitaux*, 1892):—

Female, aged 31, since her sixth year after accident uncontrollable impulses of destruction and homicidal mania. Bone pressing on temporal lobes removed by operation twenty-five years after injury. Recovery.

Case 28. Bullet wound.

Azam (*Archives générales de médecine*, 1881. Case 2):—

X., aged 38, was shot in 1870, the ball penetrating his skull at the upper end of the fissure of Rolando, and coming out about nine cm. above the external auditory meatus. A peaceful, agreeable man previously to the injury, he had changed to a bad-tempered fellow who became violent without provocation. He was trepanned and the ball extracted. After the operation the patient regained his old character.

Case 29. Bullet wound.

Dr. Wendt (*Allg. Zeitschrift für Psychiatrie*, 1875):—

A soldier, aged 25, received a shot along the whole

of the temporal region at the battle of Hallue. A year and a half later he had hallucinations of hearing and became violently maniacal, the attack setting in with a piercing pain in the left temple, and lasting five to eight days. Patient when well was a quiet and modest man. In his attacks he was noisy, quarrelsome, abusive, and violent. Two pieces of lead were extracted. Six months later he reported himself well and free from attacks.

Case 30.

Thomas Smith (*Lancet*, 1879):—

Similar case of bullet wound in temporal lobe, with recovery.

CHAPTER XIII

MENTAL SYMPTOMS IN DISEASES OF THE TEMPORAL LOBES (*continued*)

MORE CLINICAL CASES OF VIOLENT AND HOMICIDAL MANIA

In support of our theory we quote a very large number of examples from medical literature.

Examples of Violent Mania after Injury to Middle Temporal Region

Professor v. Krafft-Ebing: medico-legal case (*Ueber die durch Gehirnerschütterung und Kopfverletzung hervorgerufenen psychischen Krankheiten.* Erlangen, 1868. Case 25):—

J. L., healthy up to his twenty-first year, a quiet, peaceful man; family history good; was attacked one day and struck on the left side of the head above the ear, causing hæmorrhage from the ear. He was unconscious for nine days and subsequently deaf in the left ear. Since that time he became avaricious, greedy for money, irascible to an ever-increasing degree, so that he could bear no contradic-

tion and at once took to personal violence. Four years after the accident he married, but he ill-treated his wife and children for no or but very trifling cause, and beat them until they bled and were half dead. Punishment had no effect on him. One day a neighbour teased him and challenged him to shoot if he dared. L. did so and killed him. He immediately gave himself up with the pistol still in his hand. His state of mind was being inquired into. He was transferred to an asylum. His irascibility and violence continued there, also his covetousness. He threatened to shoot all the doctors. He suffered from headache, giddiness, and tinnitus aurium, but there were neither motor disturbance nor hallucinations.

The same author (*Ibid.* Case 16):—

G. G., aged 58, a farmer, up to then healthy and not tainted, was run over twenty-five years ago by a cart laden with stones in such wise that the wheels passed over his head, producing a dent in the bones over the left ear, three inches long, one inch broad, and one half-inch deep, stretching from the frontal bone across the temporal to the inferior part of the parietal bone. Patient was unconscious for a long time, recovering, however, completely, there remaining only some deafness in the left ear with an occasional paroxysm of rage. These affections did not, however, interfere with his vocation for twenty-three years. Two years prior to admission, subsequent to some financial losses, his excitability increased, and he had an attack of acute mania, lasting several weeks, and repeated itself again and again after lucid intervals of eight weeks. In these intervals he was mentally torpid, and had to keep a good deal

in bed suffering from headache. After admission to the asylum the paroxysms of acute mania continued with shorter intervals, varying from three weeks to ten days, and lasting, as a rule, from six to ten days. Besides the mania, he showed a morbid impulse for hoarding. The ebullitions of rage, his great destructive propensity, and his active kleptomania necessitated his isolation.. In the interval he showed signs of exhaustion. He died of bronchitis after ten years' residence. The autopsy revealed a deep scar on the left temporal bone half an inch deep, pieces of bone having pressed on the brain substance and caused softening there.

The same author (*Ibid.* Case 12):—

J. S., aged 25, innkeeper, no hereditary predisposition, previously healthy and of peaceful character, married to an evil-tempered woman, who one day threw a porcelain jug at him which struck him on the left temple. Two deep wounds in front and above the ear were the result, one having cut the temporal artery across. The wounds healed normally, but already after three weeks there was pain radiating from the scars and evoked great irascibility. The patient became violent, attacked those who approached him, complained of sleeplessness, buzzing in the left ear, from which pus oozed from the third day after the injury. His violence and destructiveness increased, necessitating his admission. There was œdema around the scar, and at the posterior part one could feel a distinct depression of the bone with projecting edges. The part on pressure proved very painful. Tormenting tinnitus aurium. On the ear trouble being attended to, the excitability of the patient diminished, and he was able to be discharged

four months after admission. On later inquiry it was found that he still suffered from pain over the area of the depressed bone, was still easily roused to anger and rage, and when in that state he would get into a mental confusion which passed quickly away.

The same author (*Ibid.* Case 24):—

A. W., aged 28, fell when twenty years old from a height on to his head, from which injury a still visible scar and fissure on the left temporal bone resulted. He showed mental confusion at first, then broke out into violent mania with extreme irascibility.

Other cases:—

Charles Phelps . .	Forty-two cases of his own. *New York Medical Journal*, 1893.
O. Herpin . . .	Several cases. *Bulletins de la Société anatom.* and *Progrès médical*, 1876.
James Ross . . .	Several cases. *Diseases of the Nervous System*, 1883.
Krafft-Ebing . .	Several cases. Friedreich's *Blätter*, 1868.
Paul Schüller . .	Several cases. *Psychosen nach Kopfverletzungen*, 1882.
Bernhard Beck . .	Several cases. *Die Schädelverletzungen*, 1865.
Landerer and Lutz	Several cases. "*Christophsbad*" *Asylum Reports*, 1878.
L. Schlager . . .	Several cases. *Zeitschrift d. Ges. d. Aerzte z. Wien*, vols. vii. and viii.
Hartmann . . .	Several cases. *Archiv für Psychiatrie*, 1884. Case 29.
Bax	Bullet wound. Fricke's *Zeitschrift*, vol. viii.
Savory	*British Medical Journal*, 1869.

W. H. Battle . .	*British Medical Journal*, 1890.
Shaw and Cripps .	*Ibid.*, 1890.
J. Lane	*Ibid.*, 1872.
J. Russel	*Ibid.*, 1865.
R. Harrison . . .	Case 4. *Ibid.*, 1869.
Flemming. . . .	Homicidal. *Bericht über die Heilanstalt "Sachsenberg."*
Billroth	*Chirurgische Klinik*, 1871.
H. Voppel . . .	*Allg. Zeitschrift f. Psychiatrie*, 1857.
J. R. Whitwell . .	*Journal of Mental Science*, 1891.
W. J. Mickle . .	Two cases. *Ibid.*, 1881 and 1885. Homicidal.
B. B. Fox. . . .	*Ibid.*, 1891. Case 2.
A. Pick	*Prager. med. Wochenschr.*, 1880.
J. Wagner . . .	*Jahrbuch für Psychiatrie*, 1889.
Van Deventer . .	*Psychiatr. Bladen*, 1887.
Gustav Spies. . .	*Zur Casuistik d. traum. Mania*, 1869.
Zierl	Case 2. Friedreich's *Blätter f. ger. Med.*, 1882.
T. C. Shaw . . .	*Archives of Medicine*, 1882.
Chas. L. Dana . .	Case 2. *Journal of Nervous and Mental Disease*, 1889.
R. W. Amidon . .	Case 6. Bullet wound. *Ibid.*, 1880.
F. Lallemand . .	*Recherches anat.-path. sur l'Encéphale.*
M. Huppert . . .	*Archiv der Heilkunde*, 1875.
L. F. Arnaud . .	*L'Encéphale*, 1888.
G. J. Guthrie . .	*On Injuries to the Head affecting the Brain.*
R. Bruggia . . .	Aphasic, but could swear when in rage. *Archiv. ital. par le malat. nervos.*, 1884.
M. Jowett . . .	Aphasic, but could swear when in rage. *Western Journal of Medicine*, 1868.
Alcock.	*Lancet*, 1877.
Lawson and Major.	*Ibid.*, 1876.
G. Thomson . . .	*Brain*, 1884.
H. Demme . . .	Three cases of bullet wounds. *Militärchirurgische Studien*, 1864.

J. Christian . . . Case 10. Bullet wound. *Archives de Neurologie*, 1889.
Daniel Clarke . . *American Journal of Insanity*, 1881.
Schäfer . . . . *Centralblatt f. Nervenheilkunde*, 1881.
Francis Skae . . *Edinburgh Med. Journal*, 1866. Case 2.
Julien Tellier . . *Traumatismes du Crâne*, 1890.

Examples of Violent Mania accompanying Tumours of the Temporal Lobes

Kaplan (*Allg. Zeitschrift für Psychiatrie*, 1897):—

A nursemaid, aged 32, suffered for about four years from great irritability and sudden attacks of anger, after which she sometimes became aphasic. She had attacks of giddiness and loss of consciousness for twelve months. During the two years she was at the asylum she proved very excitable without any cause, exaggerated little matters, and was continuously quarrelling with the other patients. She had outbursts of fury and made obscene remarks. During the last weeks of her life she suffered with headache, giddiness, and vomiting. The necropsy revealed a tumour occupying nearly the whole base of the temporal lobe.

E. Klebs (*Prager Vierteljahrsschrift*, 1877):—

Case of a man, aged 33, whose mental symptoms were violent anger with paroxysms of fury. He had a neuroglioma in left temporal cortex.

Dr. Lindström (*Hygiea*, vol. xviii.):—

Male, aged 55, fracture of temporal bone when twenty years old, healed completely. Paroxysms of fury every three or four weeks. Headache in right

temporal area. Vomiting. *Post-mortem.*—Tumour in right temporal lobe adherent to dura mater.

H. Schüle (*Sectionsergebnisse bei Geisteskranken.* Leipsic, 1874. Case 5):—

Jacob Hock, aged 56, admitted for furious mania with impulses to violence and destruction, tearing whatever was within reach. Patient developed enormous gluttony. His speech was most obscene. *Post-mortem.*—Two gummata at the tip of the left sphenoidal bone in the thickened dura mater which adhered to the brain substance.

1.	Mills and McConnell	Homicidal. *Journal of Nervous and Mental Disease*, 1895.
2.	A. Hughes Bennett	*Brain*, 1878.
3.	A. Bruce	*Ibid.*, 1883.
4.	S. J. Sharkey . .	*Ibid.*, 1889.
5.	J. B. Trowbridge .	*Ibid.*, 1891.
6.	J. Rorie	Homicidal. *Journal of Mental Science*, 1890.
7, 8.	T. S. Clouston . .	Homicidal. *Ibid.*, 1872. Cases 1 and 2.
9.	W. H. Packer . .	*Ibid.*, 1882.
10, 11.	Conolly Norman .	Homicidal. *Ibid.*, 1890 and 1893. Two cases.
12.	J. Russel	Homicidal. *Medical Times*, 1875.
13.	Crichton-Browne .	*British Medical Journal*, 1873.
14, 15.	W. T. Gairdner. .	Two cases. *Ibid.*, 1873 and 1877.
16.	J. A. Arbuckle . .	Homicidal. *Glasgow Medical Journal*, 1876.
17.	S. Wilks	Case 66. *Guy's Hospital Reports*, 1866.
18.	H. H. Hurd . . .	*American Journal of Insanity*, 1886.

19. Otto Snell . . . *Allg. Zeitschrift f. Psychiatrie*, 1875.
20. A. Richter . . . *Ibid.*, 1883.
21. J. Jensen . . . . *Ibid.*, 1889.
22. W. Fränkel . . . *Ibid.*, 1896.
23. Jacob Weiss . . . *Wiener med. Wochenschrift*, 1877.
24. E. K. Hoffmann . Homicidal. *Zeitschrift f. rat. Medizin*, 1869.
25. K. Oppenheim . . Case 7. *Archiv f. Psychiatrie*, 1877.
26. M. Huppert . . . *Archiv der Heilkunde*, 1875.
27, 28. Rousseau . . . . Two cases. *L'Encéphale*, 1888. Homicidal.
29. E. Chambard . . *Ibid.*, 1881.
30. H. Lutz . . . . *Bayr. Aerztl. Intelligenzblatt*, 1864.
31. Geoffrey . . . . *Annales médico - psychologiques*, 1865.
32. Rey. . . . . *Ibid.*, 1882.
33. Ball . . . . . *Ibid.*, 1876.
34. C. Bouchet . . . *Ibid.*, 1853.
35. M'Dowall. . . . *Journal of Mental Science*, 1881.
36. C. Bauze . . . . *Jahrbuch f. Kinderheilkunde*, 1876.

Examples of Inflammation and Softening of the Temporal Lobes with Violent and Homicidal Mania

H. Schüle (*Sectionsergebnisse bei Geisteskranken.* Leipsic, 1874). — Three cases, of which we quote Case 6 :—

M. M., aged 30, was admitted on account of an increasing mental excitability and intense headache. He soon became violently maniacal, with a stormy motor restlessness, shouting and destroying everything in the room, and threatening those approaching him. Opium relieved him only temporarily, then the scenes of violence and destruction began anew.

Pulse and temperature rose proportionately with the degree of excitement. Much grinding of teeth. No paresis. Two months after admission he died from convulsions. *Post-mortem.*—The anterior part of the temporal lobe and the whole of its base was softened, but the lesion did not involve any of the basal ganglia.

B. Ascher (*Allg. Zeitschrift für Psychiatrie*, 1893):—

A man, aged 45, was admitted on account of violent mania. The post-mortem examination revealed softening of both temporal lobes, more marked in the left than in the right.

J. Mackenzie Bacon (*Journal of Mental Science*, 1869):—

William G., aged 57, kept well till within a few days of his admission into the Cambridgeshire Asylum, when he became noisy and excited. When admitted he was in a state of restless delirium. He was fed with the greatest trouble, resisting all efforts in a blind fury, without any particular object. There was no headache, vomiting, or intolerance of light. He continued in a state of restless excitement for eleven days, when he died. *Post-mortem.*—On removing the dura mater there was a large thick greenish lymph, limited to the left middle fossa of the base of the skull.

1. B. Bramwell . . . . Case 4. *Edinburgh Medical Journal*, 1879.
2–4. H. Schüle . . . . . Cases 4, 6, 11. *Sektionserg. b. Geiteskrank.*, 1874.

5.	M. Mariani	*Archivio ital. per le mal. nerv.*, 1886.
6.	Rasori	*Centralbl. f. Bakteriologie*, vol. xiv.
7.	Stuckle	Homicidal. *Allg. Zeitschr. f. Psychiatrie*, vol. xiii.
8.	H. Voppel	*Ibid.*, vol. xiv.
9, 10.	C. Fröhlich	Cases 7 and 32. *Ibid.*, 1875.
11.	L. Willé	Case 5. *Ibid.*, 1875.
12.	O. Snell	*Ibid.*, 1875.
13, 14.	F. Meschede	Cases 1 and 2. *Ibid.*, 1873. Homicidal.
15–17.	Zohreb	Three cases. *Ibid.*, 1886.
18.	G. H. Bergmann . .	*Ibid.*, vol. iii.
19.	F. Lührmann . . .	*Ibid.*, 1896.
20, 21.	Ludwig Meyer . . .	Cases 38 and 39. *Archiv für Psychiatrie*, 1872.
22.	Fürstner and Stühlinger	*Ibid.*, 1886.
23.	Th. Zacher	Case 2. *Ibid.*, 1888.
24.	A. Alzheimer . . .	*Ibid.*, 1897.
25, 26.	M. Köppen	Two cases. *Ibid.*, 1896.
27.	G. R. Trowbridge . .	*Journal of Nervous and Mental Disease*, 1891.
28.	Chas. L. Dana . . .	*Ibid.*, 1889.
29.	O. Körner	*Berliner klin. Wochenschr.*, 1885.
30.	H. Lutz	*Bayr. Aerztl. Intelligenzbl.*, 1864.
31.	J. Luys	Case 2. *L'Encéphale*, 1881.
32.	Labory	*Bulletins de la Soc. anat.*, 1867.
33.	J. Christian	Case 6. *Annales médico-psych.*, 1874.
34.	C. Gallopin	Case 2. *Ibid.*, 1879.
35.	M. A. Foville . . .	*Ibid.*, 1882.
36.	T. R. Glyn	*British Medical Journal*, 1878.

37.	Lauder Lindsay . . .	Murray's *Royal Asylum Report*, 1860.
38.	R. B. Mitchell . . .	Case 2. *Edinburgh Medical Journal*, 1883.
39–42.	W. J. Mickle	Cases 1, 2, 3, and 6. *Journal of Mental Science*, 1880.
43.	Kenneth M'Leod . .	Case 2. *Ibid.*, 1861.
44.	S. W. D. Williams . .	*Ibid.*, vol. xv.
45.	F. Needham	*Ibid.*, 1872.
46.	T. B. Worthington . .	*Ibid.*, 1880.
47.	W. R. Wood	*Ibid.*, 1884.
48, 49.	T. S. Clouston . . .	Two cases. *Ibid.*, 1875.
50.	Frank Hay	*Ibid.*, 1895.
51.	Bleynie	*Dissertation sur l'Inflammation du Cerveau.*
52, 53.	T. D. Greenlees . . .	Cases 3 and 4. *American Journal of Insanity*, 1887.
54.	Adolph Meyer . . .	Case 144. *Ibid.*, 1895.
55.	A. Nellis	Homicidal. *Ibid.*, 1887.
56.	S. Wilks	*Guy's Hospital Reports*, 1866.
57.	A. Tamburini . . .	*Rivista sperimentale di Freniatria*, vol. v.
58.	G. H. Savage	*Brain*, 1879.
59, 60.	A. Rosenthal	Two cases. *Centralblatt für Nervenheilkunde*, 1884 and 1889.

Examples of Hæmorrhage into Temporal Fossæ

H. Voppel . . .	Cases 24 and 28. *Allg. Zeitschr. f. Psychiatrie*, vol. xiv.
A. Eichholt . .	Case 2. *Ibid.*, 1885.
E. Kundt . . .	Three cases. *Ibid.*, 1894.
T. Krebs . . .	*Ibid.*, 1895.
E. K. Hoffmann .	*Vierteljahrachr. f. Psychiatrie*, vol. ii.
Tiling	*St. Petersburg. med. Wochenschr.*, 1879.
M. A. Foville . .	*Annales médico-psychologiques*, 1871.

J. B. Andrews . *American Journal of Insanity*, vol. xxv.
T. Kirkbridge. . *Ibid.*, 1879.
Kelp . . . . . *Deutsches Archiv f. klin. Medizin*, 1872.

Examples of Chronic Middle Ear Disease with Violent and Homicidal Mania

Observation by the author. Medico-legal case:—

A highly esteemed and widely known professional man, a devoted husband and father, killed one day his wife and both his daughters, ten and thirteen years of age respectively, by cutting their throats; he then took his own life. There were signs of a struggle with the victims, but no evidence that there had been a quarrel beforehand. Indeed, his brother had spoken to him a few hours before, and at the inquest declared that he found him in full possession of his reason and with his usual amiable character. Nor had he any cares or sorrows. Patient suffered from a chronic abscess in the ear, for which he had already once been operated upon, and for which he was still under treatment. The inflammation had extended to the adjacent brain.

Another medico-legal case.

Cramer (*Gerichtliche Psychiatrie*):—

The wife of a working man, aged 32, family history normal, suffering from disturbance of the inner ear, after a confinement in which she lost a great deal of blood, heard voices: "You must cut the throats of your children, cut the throats of your children." The voices became more powerful. At last they took entire possession of her, so that she could no longer resist, and, with a large kitchen knife,

she cut the throats of her children, of whom she had so far been the loving mother.

Other examples of violent mania due to ear disease are:—

1.	Editor	Medico-legal case. Homicidal. *American Journal of Insanity*, vol. v.
2.	E. Grissom . .	Homicidal. *Ibid.*, 1887.
3, 4.	G. C. Bablett . .	Cases 3 and 4. *Ibid.*, 1877.
5.	H. Spitta . . .	Medico-legal case. Homicidal. *Prakt. Beitr. z. ger. ärztl. Psychologie.*
6.	Jansen	*Berliner klinische Wochenschrift*, 1891.
7.	L. Schlager . .	Case 6. *Zeitschr. d. Ges. d. Aerzte z. Wien*, vol. xiii.
8, 9.	M. Bouchut . .	Destructive rage. *Gazette des hôpitaux*, 1877. Two cases.
10.	Homer	Case 26. *Monatsblatt f. Ohrenheilkunde*, 1863.
11.	Wm. MacCormac	*Lancet*, 1886.
12.	Director . . .	*Wiener Irrenhausbericht*, 1858.
13.	G. Fabri . . .	*Italia Medica*, 1883.
14–16.	Schüle	Three cases. *Handbuch der Geisteskrankheiten*, 1878.
17.	H. Kukarzewski.	*Le Progrès médical*, 1894.
18.	Bennett . . .	*Dublin Quarterly Journal of Medical Science*, 1871.
19.	A. Babinsky . .	*Languedoc médical*, 1891.

If we compare these cases with the cases previously mentioned under operative cure, we can come only to one conclusion, that in all cases of middle ear disease, prompt treatment is necessary to prevent reflex irritation and possible extension of inflamma-

tion to the adjacent membranes of the brain, and consequent character changes of an excitable, violent, and even homicidal nature. This will be still more evident when in the succeeding chapter we deal with delusions of persecution arising from the same cause.

A further proof of our localisation is the fact that word-deafness and acute mania can and do occur together, but motor aphasia and word-deafness do not occur with melancholia. On the other hand, psychical- and word-blindness often occur with melancholia, but never with acute mania.

A Few Examples of Sensory Aphasia with Violent Mania

Giuseppe Seppilli (*Rivista sperimentali di Freniatria*, 1884):—

A widow, aged 51, entered the hospital in a state of violent mania. She suffered from word-deafness, though her hearing was perfect. Her mental faculties after the subsidence of the attack seemed unimpaired. *Necropsy.*—The membranes were adherent over the first and part of the second convolutions of the left temporal lobe.

Other examples:—

1. H. Liepmann . . Homicidal. *Neurologisches Centralblatt*, 1900.
2. L. Lacquer . . . *Ibid.*, 1888.
3. Bancroft . . . . *American Journal of Insanity*, 1879.

4.	W. L. Worcester .	Case 4. *American Journal of Insanity*, 1896.
5.	Schäfer	*Centralblatt f. Nervenheilkunde*, 1881.
6.	M. Bernhardt . .	*Ibid.*, 1882.
7–9.	A. Rosenthal . .	Three cases. *Ibid.*, 1886.
10.	A. Pick	*Archiv für Psychiatrie*, 1892.
11–13.	E. Bischoff . . .	Three cases. *Ibid.*, 1889.
14.	L. Bruns	*Allg. Zeitschr. f. Psychiatrie*, 1892.
15.	G. Hebold . . .	*Ibid.*, 1894.
16.	J. Fritsch	*Wiener medizinische Presse*, 1879.
17.	L. Bianchi . . .	*La Emiplegia.*
18.	F. Baizer	*Gazette médicale de Paris*, 1884.
19.	Mills and McConnell	Homicidal. *Journal of Nervous and Mental Disease*, 1895.
20.	Kussmaul	A case mentioned by the author against the localisation of sensory aphasia. Wasting of half the temporal lobe, but no word deafness, though irascible disposition (*Neurologisches Centralblatt*, 1885).

Abnormal development of the temporal lobes is sometimes the cause of violent and homicidal mania. The author has come across several such cases, but the deformity is rarely recorded in medical literature. Obernier, however, published nine cases, Voppel four cases, Arnold Pick (*Prager medizinische Wochenschrift*, 1879) one.

Another case is—

Warren L. Babcock (*State Hospitals' Bulletin*, New York, 1896).—Excessive bulging of the temporal bone on right side, making the head prominently asymmetrical:—

F. C., female, aged 31, single, native of New York, habits good, tendencies destructive and criminal in character. During childhood she was eccentric and unruly, markedly disobedient, perverse in her tastes, irritable on slight provocation, and when angered would fly into a passion, become destructive and greatly overwrought. This would soon pass away, but it was noticed that as the child grew older she became worse, less susceptible to control, and developed sundry degenerate traits of character. From the father's statement, it seems that the girl reached the age of eighteen without very serious trouble, maintaining fair self-control with only an occasional manifestation of viciousness. At the latter age, however, she had a serious outbreak, and for several weeks lost entire control of her mischievous and perverse tendencies. This was followed by a somewhat tumultuous interval of four years, at the end of which she again had an outbreak extending over a like period of time. She threatened her parents with a knife, broke dishes and furniture, and was a menace to the family safety except when in the presence of her father. Through the earlier months of her residence in the hospital she was subject to paroxysms of fury and destructiveness, during which she was mischievous, vicious, and subject to great mental restlessness. During one of these she seized a bottle of camphor and chloral liniment from a nurse and drank a portion without subsequent injury. She repented her rash act immediately afterwards, and regretted that she was unable to control her impulses. She remained excited and disturbed for four months, and then began to improve rapidly, becoming quiet, orderly, and finally manifesting few perverse tendencies.

Second admission (fourth outbreak) was after an

interval of three years. During this period she was turbulent and mischievous, but maintained fair control. Her second residence in the hospital was manifested by a repetition of her former excesses. If anything, this last attack was marked by an increase in vicious and destructive tendencies. Some of her mischievous acts seemed to be premeditated, while others had the appearance of being entirely impulsive. She would emphatically deny all of her behaviour which was unobserved but readily traceable to her as the offender. When discovered in any of her depredations, she acknowledged her guilt with profuse regrets, and promised to restrain herself in future, but, nevertheless, would take the first opportunity and from time to time attack slyly fellow-patients when nurses were not looking. One minute she would talk sociably and kindly with an associate, while the next, if unobserved, or if the converser's attention was distraught, she would strike a violent blow with anything which might be ready at hand to inflict injury. She seemed to appreciate the enormity of her offences, and regretted her lack of self-control. She was a confirmed kleptomaniac, and exhibited a high degree of secretiveness following upon her lapses. She was also a pyromaniac, having on one occasion set fire to her father's residence.

Other proofs :—

It is also well known that there are some insane patients whose mental disturbance dates from the time of an apoplectic stroke ; they are irritable and excitable, but in consequence of the accompanying hemiplegia they are prevented from becoming

violent. J. Luys (*L'Encéphale*, 1881) found that in such hemiplegic patients, with mental excitement, the temporal lobes are also involved, and Albert Rosenthal (*Centralblatt für Nervenheilkunde*, 1884 and 1889) gives examples of such cases.

Still further proof is the frequency of hæmatoma auris in violent mania, which is a sanguinous subperichondrial effusion of the auricle. On appearance of the hæmatoma, it is not uncommon that the mania ceases. Van Deusen cites several cases (*American Journal of Insanity*, 1874); also Macdonald (*Ibid.* 1877), Teats, and Fred. Needham (*British Medical Journal*).

It is not the business of the clinical physician to explain how and why a certain part of the brain functions in a particular way. His duty is fulfilled by placing on record clinical and pathological observations, which it is for the physiologist to explain. No one can deny that we have here put on record an overwhelming mass of evidence that the base of the temporal lobes is in some way related to states of excitement, from mere irascibility to violent, destructive, and homicidal mania. What is the mechanism that produces this we may well leave to others—with opportunities for physiological laboratory work—to discover.

CHAPTER XIV

MENTAL SYMPTOMS IN DISEASES OF THE TEMPORAL LOBES (*continued*)

THE SURGICAL CURE OF DELUSIONS OF SUSPICION AND PERSECUTION

THE upper posterior part of the temporal lobe seems also to be connected with the instinct of self-preservation. From a fear of their numerous enemies there arose in animals a feeling of suspicion; and in order to protect themselves against them, and to prevent themselves being destroyed, there arose a tendency to concealment, a capacity of slyness, which was also found useful in approaching their own prey. Suspicion is a protective instinct, and hence a necessary mental quality.

Morbid suspiciousness and delusions of persecution can arise, particularly in young people, from other causes than a limited brain lesion, as an exaggeration of a natural disposition to taciturnity and distrustfulness, to seek solitude, to sensitiveness of character, and a hypochondriacal condition. Such patients begin to interpret everything that happens

in a bad sense and as intended to do them harm. They suspect everybody and everything, and see hostility everywhere and are constantly on their guard; and the slightest incidents acquire in their eyes an extraordinary importance. Sometimes they begin to imagine that everybody is looking at them or talks about them. All the words they hear they refer to themselves. Gradually they suspect people spying and listening at the door, and following them when going out. Their mistrust makes them exceedingly reserved. For a time they struggle against their delusions, recognising the possibility that they are such, but gradually their delusions assume a more systematised form; they accuse a certain person or persons, authorities or societies of conspiring against them, and for definite reasons, which they can make very plausible. They now think themselves important personages to be the object of so much hate, conspiracy, or other unpleasant attention on the part of their fellow-creatures.

At this stage, or even before, actual hallucinations may set in, the principal one being that of hearing. Hallucinations of sight are extremely rare (the sight centre not being in the temporal lobe), but hallucinations of smell and taste are not uncommon, hence the idea of being poisoned. The reason for these hallucinations, as will be seen, can be explained on anatomical grounds. For we shall show that the lesion found in delusions of persecution is in the temporal lobe, so that the vicinity of the ear

will account for the hallucinations of hearing, and, as we have already demonstrated, the gustatory centres are in the same vicinity.

Tigges (*Allg. Zeitschrift für Psychiatrie*, 1888) has shown that in this form of insanity the weight of the frontal lobes is least diminished, next come the parietal lobes, and the temporal lobes suffer the greatest diminution.

Delusions of persecution may occur without any other signs of disease, and they may occur as complications in melancholia as well as in mania furiosa. The latter two are merely extensions of disease already existing, from the central parietal area in melancholia and from the central temporal area in mania furiosa to the posterior superior temporal region.

The predominant feature in mania of persecution and that systematised form of it called "paranoia" is the lack of equilibrium between the intellectual operations on the one hand, and the emotions and propensities on the other. A paranoiac is often remarkable for his shrewdness and argumentative power; he may be a scientist, a noble lawyer, a great artist, a mathematician, a politician, a skilled administrator. His defects are from a moral standpoint, inasmuch as his emotions and propensities furnish a false basis for his reasoning, and thus cause his brilliant faculties to be at the service of a bad cause—of the instincts and appetites, which, thanks to the disharmony, lead to very extravagant

and very dangerous acts. That the systematised delusion of persecution is not due to an intellectual enfeeblement, is shown by the fact that it rarely leads to dementia.

Hallucinations of hearing giving rise to delusions of persecution often lead to suicide; but this is not the same as suicide arising from melancholia. In the latter the patient thinks life no longer worth living; he contemplates death, and may prepare for it.

In the former the patient need not reflect on death at all; he simply tries to escape from his persecutors. If he happens to be on level ground, no harm need follow; if he is on a fifth-floor corridor and he can get out at the window, he may make an attempt to do so, with the inevitable consequences; but it cannot be said that he is conscious of the fatal result, nor that he seeks it.

Persecutory ideas are numerous and varied. Electrical influences, telephonic communications, invisible agencies of all kinds abound; annoyance and tormenting by spirits, magnetising dust, vile odours, poison in the food, are constantly met. The paranoiac is often regarded as a mere "crank," but from a medico-legal point of view paranoia is of great importance, because those suffering from it furnish a large portion of the acts of violence and homicide committed by the insane at large and in hospitals.

We shall quote a number of cases which ended in homicidal attacks from definite motives, in which

the patients acted with reflection and determination, such cases being important in medico-legal inquiries.

The proximity of the internal ear to this brain area accounts for hallucinations of hearing being so frequent in the delusions and mania of suspicion and persecution,—they are generally of a threatening nature,—and also explains why this same morbid mental state may arise when ear disease spreads to the temporal lobe. It is also a well-known fact that deaf people are particularly subject to ideas of suspicion and persecution.

It has been observed by several authorities that chronic middle ear disease may produce a psychosis. Whether this connection is dependent on increased intracranial pressure, direct meningeal irritation, reflex nervous conditions, or disturbed cerebral circulation, is not determined. But the fact remains that in these cases, cure of the ear disease cured the psychosis, that a return of the inflammation of the ear was followed by a return of the psychosis, and if pus was formed and retained the mental defect got aggravated.

The noises give rise to impressions varying from mere conscious illusions to hallucinations under the patient's control, and from hallucinations to dominant delusions, which finally become organised. These noises produce at first a disquieting effect, then may give rise to ideas in the patient that his friends or neighbours have some ill-feeling against him; then the patient may hear decided voices different from

tinnitus aurium, inasmuch as definite words, sentences, or phrases are heard, until the patient believes himself persecuted, and even holds conversation with imaginary persons, whose abusive talk molests him. Sometimes the voices heard are of an imperative nature, which the patient, when exhausted from the long-standing worry and anxiety, cannot resist.

The delusions are not attributable to perversions of the reasoning process, but arise out of the perverted emotional state. This gives rise to misinterpretations of actual occurrence in accordance with the prevalent state of the feelings. When the disorder has lasted some time, and the false ideas are habitually dwelt upon, they become realities to the consciousness of the individual.

Whenever we get delusions of persecution, we should inquire for hallucinations of hearing. Fisher (*American Journal of Insanity*, 1888) found only two exceptions in 47 cases of mania of persecution that came under his notice. Boucheron (*Gazette des hôpitaux*, 1887) observed mental troubles of suspicion and persecution to accompany ear disease. Dr. Marie did the same, so did Lasègue and Fürstner. Increased pressure alone seems to suffice to set up delusions, for the moment pus escapes from the ear, the mental trouble disappears. This is an observation made by Schüle, Koeppe, Griesinger, Jacobi, Körner, Huguenin, Morel, Robin, Bennett, and MacEwen, who have all reported similar cases.

Redlich and Kauffmann found 90 per cent. of para-

noia cases among patients suffering from ear trouble. W. S. Bryant claims only 50 per cent., but puts nearly the whole of the remaining cases under "dementia."

Swift's middle ear disease caused insane suspicion and irritability. From his irritability resulted his cruelty to Stella.

Our first observation of the posterior temporal area having a relation to suspicion and persecution was the following:—

A young South-American had been sent to London for a change of scene, after he had fractured the mastoid process in a fall from his horse, and had become mentally unsound. When we were consulted, he had secluded himself from all society, and complained, amongst other suspicious ideas, chiefly of threatening persecutors. An operation was arranged, but before the day fixed upon he threw himself from a third-floor window and was killed.

Our first case of successful operation was the following:—

Patient had chronic ear disease from his childhood. He was mentally quite normal, and an active business man until two years ago, when in consequence of ideas of persecution he changed his occupation rather frequently and succeeded in none. Getting worse, he refused to eat any food that had not been first tasted by others, and refused to speak with any one except his nearest relatives, to whom he spoke quite rationally, thus showing that he was suffering from a disordered state of feeling, and not of the intellect. An examination was made of his ears; and the disease in the right ear was

healed, but there was necrosis of the left ear. When he was operated upon, the left temporal bone was found of ivory-like hardness, there was not a trace of mastoid cells, and the bone had to be chiselled through to get at the brain. The dura was thickened and was cut cross-like in two. The wound healed readily, and patient spoke to his attendants directly after the operation. He got perfectly well, and remained so.

2nd Case of operation.

W. Rhys Williams (*Journal of Mental Science*, 1879):—

D. C., aged 26. Had enjoyed good health, was industrious and sober until some days before admission, when he became excited, noisy, and violent. He was continually swearing and screaming, said he saw devils, and was violent. Six months later it was noticed that he had a profuse purulent discharge from the left ear. He said he had had this for months past. Slowly a large puffy swelling formed over the left mastoid process and spread up over squamous portion of temporal bone. On pressing this the discharge ran freely from the meatus. As a rule the patient was sullen and dangerous, and would not allow any one to examine him. He fancied the doctors wanted to injure him. The following month, the abscess having got still bigger, it was opened, and *he became sane at once.* No further discharge took place from the ear.

3rd Case.

Koeppe (*Archiv für Ohrenheilkunde*, 1875. Case 1):—

Richter, a miner, sustained, when 31 years of age,

a fracture of the base of the cranium, was eight days unconscious, and ill for three months. He became somewhat deaf, and there continued buzzing in the right ear. Two years after the accident he became mentally changed. He suffered from delusions of persecution: people robbed him of everything, intended to poison him, spoke badly of him. He threatened to kill his wife and children, and to commit suicide afterwards. The otorrhœa got worse, and with it his delusions. On treating the ear disease his *mental derangement disappeared completely.*

4th Case.

E. Régis (*Annales médico-psychologiques*, 1882):—

A young man, aged 22, received, when thirteen years old, such a severe box on the left ear that purulent middle ear disease resulted from it, which became chronic. Typhoid fever in his sixteenth year made the ear disease worse, and he became quite deaf in the left ear. Since then he had hallucinations of hearing of an insulting character; yet the patient was conscious of their origin, and had no delusions about them. *Local treatment* of the disease made the hallucinations disappear.

5th Case.

B. Ball (*L'Encéphale*, 1882):—

Similar case, with cure.

6th Case.

Amberg (*Journal of Nervous and Mental Disease*, 1906):—

Also operation and recovery.

7th, 8th, 9th, and 10th Cases.

W. S. Bryant (*Annals of Otology*, St. Louis, 1905):—

Four cases of persecutory mania with auditory hallucinations. Recovery after operative treatment.

11th Case.

Charles Phelps (*Traumatic Injuries to the Brain*, 1898. Case 240):—

Male, aged 45, thrown from a truck in a collision. Unconscious. Third day ecchymosis over right mastoid process and extending upon the back of the ear. Irrational and required restraint, had delusions, saw imaginary persons, and heard scoffing voices, was easily annoyed when spoken to, considered it an outrage to find himself subjected to having his temperature taken. His mental faculties were completely restored.

12th Case.

Edwin Goodall (*Lancet*, 1898):—

Male patient, aged 29, previously healthy, always temperate. No hereditary tendency. Six weeks before admission he received a kick from a horse on the left mastoid process, which rendered him unconscious. He bled from left ear. After coming round he developed marked delusions of suspicion, and exhibited violence, so that he had to be transferred to Hanwell Asylum. Considerable scar over left mastoid process. Complete left facial paralysis. After a month's treatment he became perfectly rational. Discharged three months later, and a month after discharge patient reported himself well and at work.

13th Case, of *non-traumatic* origin.

Damer Harrison (*Journal of Mental Science*, 1902):—

It is that of a gentleman, aged 46, who held an important Government appointment, who was admitted into the Haydock Lodge Asylum, under the care of Dr. Street, on 4th June 1896. His sufferings were then of a year's standing, and the special point about the case was that he never himself believed in his delusions, and was always perfectly clear as to their fictitious character. The delusions consisted in the constant hearing of voices, night and day. They were, however, always voices which he recognised as those of people he had known, chiefly near relations and friends. The voices were generally disparaging and threatening. He did not believe in these hallucinations, except when worn out from want of sleep; he would give way so far as to say that he was afraid there was something in them. From all the subjective symptoms, the view arrived at was that there might be an irritative lesion influencing the auditory centre for speech. The fact that the patient was a right-handed man, and that there were two tender spots in the region of the auditory centre of the left side, determined the side upon which to operate. A large opening in the bone was made almost semicircular in shape, being three inches in the antero-posterior diameter and two and a half inches in the vertical. The bone appeared to be unusually brittle, and the dura mater, on exposure over the central portion of the opening, had a slightly abnormal yellowish appearance. The brain covered by the dura mater bulged into the opening of the bone, the pulsation being so slight as to be hardly perceptible. The dura was

then opened. The brain surface in the centre of the opening presented a somewhat cloudy appearance, and at a point corresponding to a point on the lower aspect of the superior temporo-sphenoidal convolution there was a small elevation in the cortex, somewhat transparent in appearance, as if due to a thinning of the cortex from deep pressure. This gave way on palpation, and a small current of serum escaped, which at first spurted vertically into the air. This flow of serum continued for several minutes, the cortex gradually assuming a concave instead of a convex bulging surface. At the same time the pulsations of the brain became quite normal. A few strands of horsehair were used as an intra-dural drain, the dura being closed by a continuous catgut suture. The wound healed by first intention.

The day after the operation.—Unless the patient pays special attention, what appeared as voices to him yesterday is now simply a jumble of noises, and far more distant than formerly. *Four days after operation.*—His opinion about the voices is still vague; he thinks he hears them at times, but says that he has not been so peaceful and comfortable for eighteen months. His general mental aspect has undergone a marked change; instead of being entirely wrapped up in his own misery, silent, and often in tears, he watches what is going on in the room, is inclined to talk, his manner is bright, and he frequently expresses his thanks for all that has been done for him. He chats with his nurses, and is anxious as to their comforts, walks, hours of sleep, etc. All this shows a complete change in the man as we have known him during the past seven months. *Five days after operation.*—Sounds very indistinct and uncertain,

and cannot identify them as voices. *Seven days after operation.*—Hears no abnormal sounds. *Ten days after operation.*—All traces of depression have left him. *Twelve days after operation.*—No voices or abnormal sounds; sleeping well without sedative. *Twenty-four days after operation.*—Discharged from the asylum in quite a normal condition. The patient was seen three months later, and there had been no relapse.

Cases 14 to 17.

G. Burckhardt (*Allg. Zeitschrift für Psychiatrie*, 1891):—

Case 14.—Mrs. B., married, healthy up to thirty-fourth year, then became melancholic, suicidal, developed delusions of persecution, and became dangerous to those around her. For sixteen years she remained in this condition in the asylum. Dr. Burckhardt removed a strip of the parietal lobe (gyri angularis and supra-marginalis — seat of melancholia — see preceding chapter) and a strip of the posterior part of first and second right temporal convolutions (also part of Broca's convolution without influencing her speech). He claims that patient *lost her desire for attacks and abuse and her delusions*, and instead of the depressed condition *became lively and communicative.*

Case 15.—This subject was a man, aged 35, who had been four years in the asylum. He was suspicious, had fear of being poisoned, became threatening, heard voices, and was violent and destructive. Dr. Burckhardt trephined for the auditory centres above left ear, and removed about 2·8 grammes. The brain was found of a slate

colour. The patient did not become word-deaf after this operation, but the *hallucinations became less intense* and the mental condition improved. He was now perfectly quiet, and took an interest in things.

Case 16.—M. M., artist, delusions of persecution with hallucinations of hearing which caused irascibility. Auditory area excited, weight of brain removed 4·6 grammes. Patient lost his irascibility. Dr. Burckhardt in a second operation removed another strip, when the patient's mind cleared up. He began to draw again, could play a game of cards and billiards correctly, became polite and obedient.

Case 17.—B. B., widow, aged 37, had hallucinations of hearing for eight years, delusions of persecution, and impulses to kill her sister and child. A portion of the brain weighing three grammes was removed from the posterior half of the first and second temporo-sphenoidal convolutions. The removed brain substance was found unusually soft. Her quarrelsome tendencies, her delusions and impulses to kill disappeared, and she was delighted with her child again. She was discharged and kept well, but the following year was found drowned—whether suicide or accident could not be ascertained, only that she left home in a perfectly happy frame of mind.

CHAPTER XV

MENTAL SYMPTOMS IN DISEASES OF THE TEMPORAL LOBES (*continued*)

MORE CLINICAL CASES OF DELUSIONS OF SUSPICION AND PERSECUTION

For the confirmation of this localisation the following examples of mania of persecution due to injury, ear disease, inflammation, tumours, and other pathological conditions of the posterior part of the temporal lobes may serve.

Julius Kratter: a medico-legal case (Friedreich's *Blätter für gerichtliche Medizin*, 1889):—

Josef H., while walking with some companions, had, as afterwards was shown, a momentary delusion of persecution, and this delusion incited him to knock one of his friends down, and when attacked by the other, he stabbed him several times apparently in self-defence. On arrival home he boasted of his intention to murder thirty persons, and became very noisy and threatening. Numerous witnesses declared H. to be a violent, threatening, and dangerous man, and that the change of his character dated from the receipt of an injury to his head.

The first medical opinion declared H. to have been conscious of what he was doing, and thus responsible for the act. He was believed to be simulating. A second examination of the state of his mind showed the defendant to be intellectually a very clear-headed man, definite in his statements, adhering to them under cross-examination, having a good memory of facts and events, and never contradicting himself. He stated that twenty years before he was run over, and received a severe wound which caused him to be paralysed and speechless for a few weeks, and altogether indisposed for a whole month. A brother of his stated that since that time defendant had been intolerant to alcohol. Defendant remembered every detail of the act which he was accused of, but stated definitely that his two companions intended to kill him. Questioned further, he said he was not mad; he heard them distinctly arranging the plot; he knew what he was doing, and was not going to let himself be murdered without some self-defence. It was then ascertained that defendant construed some remarks made by his companions in this sense, and when he walked faster to escape them they also followed him more quickly, whereupon he turned round and fought, with the result given above. In reply to inquiries by the medical experts, he admitted having other enemies in the village, and gave their names and their intentions. Asked why he did not prosecute his enemies, he admitted that he summoned one of them, but the magistrate would not grant the summons. He believed the magistrate had been bribed.

The physical examination revealed the following anomalies: right side of face redder than left, paresis of sympathicus on right side, also facial

paralysis of same side. Over the ear at the junction of the right temporal with the parietal bone there was a depression the size of a five-shilling piece, holding three fingers easily. Superficial tissues were adherent. Scar not tender but sometimes painful. Right pupil larger than left. Opinion of experts that defendant had suffered for many years from delusions of persecution; that these delusions dated from the injury, and had increased when hallucinations of hearing appeared. Moreover, he construed everything that might be said or done in the sense of his delusion. Since the injury he had grown very irascible. In his anger he often spoke nonsense, and the laughter and remarks caused thereby by those around him only increased his irascibility and delusion. Simulation was declared to be out of the question.

In a postscript, the author states that the Court handed the prisoner to the mayor of the district to deal with him as he thought proper. The mayor intended to send him to a lunatic asylum at once, but a superior authority intervened, so that H. was left at large. He immediately resumed his threats and violent behaviour, and to such an extent that the local people had to petition the Government to place H. in an asylum, since he was a public danger. Dr. Kratter added a special certificate. Only then was H. secured.

Paul Schüller (*Psychosen nach Kopfverletzungen.* Leipsic, 1882. Case 2):—

F. B., aged 16½, an apprentice, with ear disease from his earliest youth, received a blow in a fight with a piece of wood which broke into pieces. It hit him at the posterior junction of the right

temporal and parietal bones, leaving a scar. He became insane on the following day. He suffered from extreme mania of persecution. He was in fear of being hacked to pieces and of being poisoned; he was suspicious of everybody and everything, and to defend himself became extremely noisy, violent, and made attempts at homicide.

W. Julius Mickle: bullet wound (*British and Foreign Medico-Chirurgical Review*, July 1876. Case 6):—

A soldier, aged 35, in service eighteen years. The right temple had been struck by a shell before Sebastopol. After severe syphilis, acute pain and great tenderness over the right mastoid process and right temple. Dr. Mickle says: "Delusions and excitement obtained from the first; these continued at Netley, and he became impulsively violent towards other patients, under the false notion that they came into his room at night and annoyed or injured him." At Netley he had hallucinations of hearing and delusions of being constantly tormented. At one time there was severe shooting pain in the left temple with great tenderness.

Ch. Vallon (*L'Encéphale*, 1881):—

Patient, aged 35, had delusions of persecution. Four months later he had hæmatoma of right ear. He died a fortnight later of pneumonia. *Post-mortem.*—There were sanguinary effusions on both sides in the posterior part of the temporo-sphenoidal convolutions.

W. Fränkel: a medico-legal case (*Allg. Zeitschrift für Psychiatrie*, 1869):—

S. A., a very conscientious woman, aged 29½,

whose house was burnt, including all her property, which was not insured, interpreted some remarks by the neighbours as meaning that her husband had caused the fire. Fearing his arrest, she got into a state of terror, and left quietly, with her two children, the scene of her misfortune. An hour afterwards her cries were heard from a pond in the neighbourhood, where she had drowned her children and made an unsuccessful attempt to take her own life in the same way. She was arrested. At the trial she remained reticent, but betrayed in every feature and look her extreme anxiety, and gave the judge the impression that she felt her guilt so much that she was afraid to betray herself if she spoke. Expert evidence showed that her silence, refusal of food, sleeplessness, and fever, etc., indicated some mental derangement. She was sent to the psychiatrical clinic for further observation. She was found much depressed, but this condition had begun long before the fire. She was also hereditarily tainted. On her head in the region of the left parietal bone some ulceration was observed. Her fever increased, and with it her fear of death. She asked for a priest, and confessed to him that she herself laid the fire to get away from the town, which she abhorred, and gave details of the preparations she had made to fix the suspicion on others; which confession left the impression on the judge, to whom she repeated it, that she had told the truth and was not under a delusion. She died of pyæmia. *Post-mortem.*—There was necrosis of the left parietal bone with loose pieces, the parietal lobe being covered with pus, which had made its way to the temporal area and middle fossa. Dr. Fränkel thought the necrosis was the result of an injury.

A. Köhler: a medico-legal case (*Allg. Zeitschrift für Psychiatrie*, 1877):—

A woman, aged 47, a habitual thief with long records of imprisonment, whose trials were always interesting by reason of the craftiness with which she planted her guilt on others, became quarrelsome and violent in manner. Four weeks after being discharged she committed another theft, and received one year of hard labour for it. But this time her mental state obtained notice, and she was sent to an asylum. Her violence was accounted for by horrible delusions of persecution with hallucinations of the same kind; she saw only enemies, detected poison everywhere, but, unlike a melancholiac, who would simply refuse to eat, she destroyed the plates and dishes and behaved altogether outrageously. She remained in this condition for years. Gradually paralysis set in. She died of phthisis. *Post-mortem.* —There was softening of the temporal lobe.

J. T. Eskridge (*Journal of Nervous and Mental Disease*, 1889):—

J. P., male, aged 30, Colorado ranchman, contracted typhoid fever. A month later he was fairly convalescent from fever, but the disease had left him with a purulent discharge from the right middle ear. During the following fortnight he was observed to be getting irritable, and one day was found in bed delirious, and with the delusion that his attendants were trying to kill him. His eyes followed the physicians and people in the room, as if suspicious of the actions of those by whom he was surrounded. He accused his attendants and Dr. Eskridge of seeking an opportunity to kill him, and cursed them accordingly in

the unpolished language of a Western ranchman. The doctor received profane abuse for every question that he put to him. There was a sanious or semi-purulent discharge from the right ear, slight in amount but offensive in character. His appearance was depressed and anxious. His left arm and muscles of left angle of mouth were paretic. He was trephined and a large abscess cavity emptied; but the patient's improvement was only of short duration, and he died on the fifth day. *Post-mortem.*—Besides this cavity, pus was found on the petrous portion of the right temporal bone with meningeal inflammation around.

Other examples:—

1.	F. Jolly	Bullet wound. *Archiv f. Psychiatrie*, 1872.
2.	Hartmann . . .	Tumour. *Ibid.*, 1884. Case 31.
3.	K. Cramer . . .	Inflammation. *Ibid.*, vol. xxi.
4.	Dagonet	Tumour. *Annales médico-psychologiques*, 1882.
5.	L. Schlager . .	*Zeitschr. d. Ges. d. Aerzte z. Wien*, vol. xiii.
6.	Krafft-Ebing . .	Bullet wound. *Ueber die durch Gehirnerschütterung u. Kopfverletz. hervorgerufenen psychischen Krankheiten*, 1868. Case 8.
7, 8.	Landerer and Lutz	"*Christophsbad*" *Asylum Report.* Cases 19 and 22.
9.	Tomaschewsky and Simonowitsch	Inflammation. *Wjestnik psichiatrii i nevropatologii*, 1888.
10.	T. Deecke . . .	*American Journal of Insanity*, 1883.
11.	T. D. Greenlees .	Softening. *Ibid.*, 1887. Case 2.
12.	C. P. Tanner . .	Hæmorrhage. *Brain*, 1890.
13.	G. H. Savage . .	Abscess. *Ibid.*, 1878.

14, 15.	H. Schüle . . .	Tumours. Cases 9 and 10. *Sektionsergebn. b. Geisteskr.*, 1874.
16.	R. M. Marshall .	Tumour. *Journal of Mental Science*, 1909. Case 4.
17.	Parchappe . . .	Sclerosis. *Traité de la Folie.*
18.	Bourneville . .	Case 4. *Archives de Neurologie*, 1880.
19.	G. C. Cablett . .	*American Journal of Insanity*, 1877.
20.	F. Baizer . . .	Softening. *Gazette médicale de Paris*, 1884.
21.	Albert Rosenthal.	Softening. *Centralblatt für Nervenheilkunde*, 1884.
22.	W. C. Hood . .	Softening. *Journal of Psycholog. Medicine*, vol. xi.
23.	T. C. Shaw. . .	Softening. *Archives of Medicine*, 1882.
24.	John Keay . . .	Softening. *Journal of Medical Science*, 1894.

Examples of Delusion of Persecution with Melancholia and Softening of Parieto-Temporal Area

25.	Conolly Norman .	*Journal of Mental Science*, 1894.
26.	W. Fränkel. . .	*Allg. Zeitschr. f. Psychiatrie*, 1869.
27.	G. Hebold . . .	*Ibid.*, 1894.

These cases of delusions of persecution arising from irritation or lesion of the posterior part of the temporal lobe are not merely of interest and value from a strictly medical point of view, but also from a medico-legal point of view, and for this reason deserve our careful consideration.

CHAPTER XVI

MENTAL SYMPTOMS IN DISEASES OF THE TEMPORAL LOBES (*continued*)

THE HOARDING INSTINCT AND KLEPTOMANIA

In order to preserve existence, some animals found it useful not to have at all times to hunt for food, which may be scarce at certain periods, and began to store up things for future use. Thus developed the *hoarding instinct*, a tendency to make provision for the future. Man not only stores up provisions for winter, but he acquires property of all kinds for all his life and for his posterity. The desire to acquire is natural to every one, but varies in strength in different people; and, like other instincts, it is liable to become morbidly exaggerated to cupidity, greed, miserliness, and kleptomania.

The hoarding instinct in man is guided and controlled by the intellect and moral faculty. In the child this instinct shows itself quite naturally. The child will seize everything and appropriate what does not belong to it. Idiots and imbeciles will steal, the intellect being deficient to check the

animal instinct. Love of possession is a natural disposition implanted in the human organisation, and dishonesty is only the result of absence of controlling motives.

Persons with a naturally active tendency to acquire, and having their intellect confused owing to some bodily or brain condition, may steal. Thus pregnant women have been caught in the act of shop-lifting.

In asylums, kleptomania is of most frequent occurrence in imbeciles, general paralytics, and epileptics. As a rule, idiots and imbeciles steal without reflection, and merely to satisfy their animal instinct. They will purloin whatever takes their fancy. Sometimes they display a considerable amount of ingenuity and low cunning in their methods of procedure. Acts of stealing occur in the initiatory stages of general paralysis and sometimes in the later stages as well. The patients steal under the delusion that everything they see belongs to them. They appropriate all sorts of articles, hoard and conceal them, and immediately afterwards lose all recollection of them. Theft may also be the unconscious act of an epileptic.

Cases of pure kleptomania, not complicated with any other disorder, occur more in private than in asylum practice, hence there are few cases officially recorded where a post-mortem examination has been undertaken to determine the seat of the lesion. According to the evidence we are about to offer, the probable seat of the lesion seems to be the upper anterior part of the temporal lobe.

Case 1. Medico-legal case.

Cesare Lombroso (*Archivio di psichiatria*, 1882).

A typical case of morbid love of hoarding arising from an injury to the head :—

The patient, aged 64, a rich citizen, was renowned for his sordid avarice. He was found to have an immense inclination to theft. He kept a set of burglary instruments, by means of which he robbed not only his servants, whom he frequently changed, but the guests whom he invited to his house and entertained there. The proceeds of his robberies he sold. This man fell, when a boy eight years of age, from a height on to a stove, and injured his left temple. He lost his left eye through the accident, and the temple bulged for ever afterwards. Lombroso very correctly thinks that this injury has caused changes in the brain which produced these morbid inclinations. Here would have been a case for the surgeon.

Case 2. Medico-legal case.

Zierl (Friedreich's *Blätter f. ger. Medizin*, 1882) :—

L., aged 34, was wounded in the left temple in the war of 1870. The wound healed only after a year. There was a depression in the bone to which the superficial tissues were adherent, which became tender on pressure and in changes of weather. Patient, who was previously mentally sound and honest, had a *delusion that everything he saw belonged to him.* L. had been sentenced eleven times before for appropriating other people's goods. On the twelfth occasion he was sent to the asylum for observation, where paroxysms of irascibility were noticed, which were accompanied by the delusion that

everything that he saw belonged to him. Acting on this delusion, he had kept other people's property, and hence the numerous committals for embezzlement. He was declared not guilty, as suffering from kleptomania.

Cases 3 to 5.

Krafft-Ebing (*Ueber die durch Gehirnerschütterung und Kopfverletzung hervorgerufenen psychischen Krankheiten*, 1868):—

There are three cases, 2, 16, and 25. As an example, Case 2 may suffice. It is that of a patient,

C. D., aged 39, labourer, single, hitherto healthy, who had fallen over a staircase and had knocked his head on the right temple so hard that he remained for some time unconscious. Apart from the swelling of the part, there were no signs or symptoms, and patient quickly recovered. Soon, however, he developed two morbid tendencies for which he was sent to the asylum two years after—kleptomania and voraciousness. He could not distinguish what was his own and what was other people's property. He showed some maniacal excitement occasionally only, as a rule he was quiet. *The kleptomania continued up to his death*, four years after the accident.

Case 6.

Wm. Julius Mickle (*Journal of Mental Science*, 1885):—

J. W. T., aged 47, married, had sustained a very severe blow on the head from a stone nearly two

years previous to admission. The place struck was *in front and slightly above the left ear.* Patient became subject to delusions about money, and would secrete trifling objects about the house, and fill his pockets with coke. *Post-mortem.*—There was decortication and adhesion of the left temporal lobe.

Other cases:—

7, 8. Kenneth M'Leod .	Cases 1 and 2. *Journal of Mental Science*, 1861.
9. J. Christian . . .	Case 10. *Archives de Neurologie*, 1880.
10. Ludwig Meyer . .	Case 38. *Archiv für Psychiatrie*, 1872.
11. Thomas Smith . .	*Lancet*, 1879.
12. E. Klebs	*Vierteljahrsschrift f. Prakt. Heilkunde*, 1887.
13. Warren L. Babcock.	*New York State Hospitals' Bulletin*, 1896.
14. A. Spanbock . . .	*Neurologisches Centralblatt*, 1895.
15. Paul Guder . . .	*Geistesstörungen nach Kopfverl.*, 1886.
16. Kelp	*Deutsches Archiv f. Klin. Medizin*, 1872.
17. Clovis Gallopin . .	*Annales médico-psychologiques*, 1879.
18. A. Köhler	*Allg. Zeitschrift f. Psychiatrie*, 1877.

CHAPTER XVII

MENTAL SYMPTOMS IN LESIONS OF THE OCCIPITAL LOBES

THE occipital lobes are still terra obscura. But from anthropological and clinical observations it would seem that they are related to the gregarious instinct, and are the seat of the affections.

"A psychical symptom of the softening of the occipital convolutions that follows hæmorrhage is emotionalism, or loss of inhibitory power over muscles that express the affective states" (*Journal of Mental Science*, April 1879).

Women, speaking generally, are more emotional and less intellectual than men. In harmony with this statement is the observation that women have more brain than men posterior to the great central fissure, and less anterior to it.

Welcker found 73 per cent. of female skulls dolichocephalic (long-headed). Richter (Virchow's *Archiv*, vol. cxxviii.) and Broca confirmed the results of Welcker. According to them, it would appear that the greater length of the female head, as com-

pared with that of the male, is due to its additional occipital length. Cunningham, according to Havelock Ellis, assigns to women a longer occipital lobe.

Huschke found the same. Dr. A. Weisbach, in his book *Der deutsche Weiberschädel*, also certifies to the larger occiput of women as compared with men.

Lombroso found a short occiput, hence brachycephalic heads, and a complete absence of affection in female criminals (though their libido sexualis is increased).

P. Näcke (*Archiv für Psychiatrie*, 1893), too, examined the brains of female criminals, and found that those committed for murder had a deficient occipital lobe. In the other—thieves, etc.—the occipital lobes were of normal size.

Benedikt has described the brains of three murderesses in whom the occipital lobes were short and did not cover the cerebellum.

Ferrier observed "that the only effect after extensive destruction of these lobes on both sides in a monkey was a remarkable state of depression with refusal of food." Sensation and voluntary motion were unaffected.

Munk says of a dog whose posterior lobes he destroyed: "The sight of men whom he used to greet joyfully now leaves him cold, and even the company of dogs with whom he used to play leaves him unmoved." Thus showing destruction

of the gregarious instinct which gives social affection.

Loeb found that after destruction of the most posterior part of the brain (occipital region) of a bitch it lost its parental attachment, and neglected its puppies directly after delivery.

Monkeys are the first to possess large occipital convolutions, hence it is easy to distinguish a male from a female monkey brain. Psychologically it is interesting to note the great attachment of monkeys for their offspring; for example, of the gorilla and chimpanzee, who are jealous of the fidelity of their partners and very devoted in their attention to them. Orphan monkeys, according to Brehm, are always adopted and carefully guarded by other monkeys, both males and females.

All that is positively known about the function of the occipital lobe is that its calcarine region is related to the sense of sight. This relationship was known to Emil Huschke, who wrote:

"The posterior lobes are no doubt in ultimate relation with the emotional life and the sense of sight. No other sense-organ has such an intimate connection with the tender feelings and grief as that of the nerve of sight, the fibres of which can be traced to the convolutions of the posterior lobes. Apart from the mimicry of the eye, in which all affections are most vividly reflected, weeping is the best of all proofs."

Case 1.

G. H. Bergmann (*Zeitschrift für Psychiatrie*, vol. iii. Case 1):—

Ernestine S., aged 27, of a moral character and very romantic nature, fell in love and was carried away by her vivid love-imagination and pure devotion, to which the practical lover not only did not respond but in the end married another girl. Notwithstanding this fact, her love, though he was gone, continued true to him, and she would sit all day sighing for him and whispering his name. Her mind was only occupied with thoughts of love. She died. At the post-mortem examination the only peculiarity that was found was the prominence of the occipital lobe, which projected fully an inch beyond the cerebellum.

The same author (*Ibid.* Case 3):—

Marie B., on admission aged 24, had changed in character for about two years. Disappointment in love was the cause, and thoughts of her lover together with sighing and weeping, were the chief features of her mental state. *Post-mortem.*—It was found that the occipital lobes projected considerably beyond the cerebellum.

Case 2.

Cesare Lombroso (*The Criminal*):—

Strocco, when 16 years old, killed his father and brother, and attempted to poison his mother. He was religiously inclined. He died in the asylum at Reggio of phthisis. *Post-mortem.*—Frontal lobe well developed, occipital lobe very defective. Osteophytes in the middle fossa of the skull.

Case 3.

O. Hotzen (*Vierteljahrsschrift für gerichtliche Medizin*).—Brain of a "matricide":—

Marie Köster, aged 22, was a fairly educated woman of a nervous type, and was religiously inclined. The defect in her character was absence of all affection, culminating in an active dislike of her parents. One morning, apparently in full consciousness, she killed her mother. *Post-mortem.*—The occipital convolutions were defectively developed, were very small, and did not cover the cerebellum.

Case 4.

W. Charles Hood (*Journal of Physiological Medicine*, vol. xi.):—

L. D., a female criminal patient, died at the age of 66, after a residence in the asylum of thirty-three years. This woman was tried at Worcester for the crime of *infanticide*, and acquitted on the grounds of insanity. *Autopsy.*—Serous infiltration of the left occipital lobe.

Case 5.

David Ferrier (*West Riding Lunatic Asylum Medical Reports*, 1874):—

N. B., housewife, aged 44, suffering from "melancholia," attempted on *one occasion to throw one of her children into the fire.* She had also struck her other children repeatedly, in a manner previously unusual to her. *Post-mortem.*—Softening of parietal and occipital lobes.

Case 6.

T. S. Clouston (*Journal of Mental Science*, 1872):—

Patient, J. R., who had lost his affection for his wife and family, and became abusive and violent to them. *Post-mortem.*—A tumour involving the occipital lobe.

Case 7.

Charles Phelps (*Traumatic Injuries to the Brain and its Membranes*, London, 1898):—

This case, which was quoted under "melancholia," may be again referred to. Case 278, a male, aged 30, after a fall, in which the *posterior region of his head* was injured, developed delusions which caused him much distress. One was the *fancied* death of his wife; a little later he became convinced that this bereavement was only imaginary; he was equally positive that another delusion, the *death of his child*, was real. This lasted for many weeks. He suffered acute mental anguish in each instance, and his agony could not have been greater had these pure fancies been actual facts. An *inclination to weep* was manifested on ordinary occasions alike without cause, as well as when discourse turned upon his family afflictions, but his speech was always coherent. He gradually recovered.

Case 8.

S. V. Clevenger (*Alienist and Neurologist*, St. Louis, 1888. Case 11):—

J. H., aged 42, merchant, had fallen upon his occiput when a boy of twelve, and suffered frequent

pain in this region, growing worse with age. He had hallucinations, seeing his room filled with apparitions of his friends. No other mental or physical symptoms.

Case 9.

Ernest Bischoff (*Archiv für Psychiatrie*, Berlin, 1899):—

J. T., aged 65, a woman suffering from violent mania. The one topic of conversation was her children; she was always longing for them, yet when they came to visit her she failed to recognise them. *Post-mortem.*—Besides atrophy of both temporal lobes, there was a lesion in the left occipital lobe.

Case 10.

T. M. T. MacKenna (*Journal of Nervous and Mental Disease*, 1908):—

Case of a man, aged 50, with cystic tumour in right occipital lobe, who had delusions of unfaithfulness on the part of his wife.

Case 11.

H. Schüle (*Sectionsergebnisse bei Geisteskrankheiten*, 1874. Case 3):—

M., aged 36, was borne down by grief at the death of his youngest child. His sadness knew no bounds; he could neither work nor sleep; he was unable to concentrate his mind on anything, and became

forgetful, so that all his affairs got into disarray. He was in a state of gloomy anxiety. He died of pneumonia. *Post-mortem.*—The occipital lobe was much developed, and there was yellow infiltration of the superior occipital convolution.

CHAPTER XVIII

THE FUNCTIONS OF THE CEREBELLUM

THE cerebellum is so seldom examined at autopsies that it is no wonder we have so few clinico-pathological data as to its functions. All we know is that the central portion has to do with incoordination, cerebellar ataxy, and that extensive and even gross destruction of the lateral lobes of the cerebellum may take place without producing *any obvious symptom.* Physiologists ascribe to it no mental function whatsoever, and the antiquated theory of its relation to libido sexualis is considered by them as exploded. But that there is, in addition to the subsidiary lumbar centre, such a centre somewhere in the brain—and probably adjoined to the cerebellum, if not in the cerebellum itself—a good many clinical observers are agreed. For this reason it may be as well to reproduce material in favour of this theory, and we may hope that some investigator may discover the actual localisation of this—one of the most primary instincts, which must be somewhere in the region of the occiput, perhaps

in the *occipital* convolutions resting on the tentorium.

Gall (*Fonctions du Cerveau*) was the originator of this theory, and cited numerous clinical examples. Baron Larrey, a military surgeon, in his *Observations on Wounds*, quoted quite a number of cases of his own experience. Serres (*Journal de Physiologie*) produced also a number, so did Burdach (*Bau und Leben des Gehirns*), Dr. Epps, and Sir Alexander Morrison published several cases. John D. Fisher's cases (*American Journal of Medical Sciences*, vol. xxiii.) are most interesting, so are Hammond's three cases (*Quarterly Journal of Psychological Medicine*, vol. iii.). Coming to more recent times, there are four cases by A. Otto (*Centralblatt für Nervenheilkunde*, 1877), seven cases by Carpenter (*Human Physiology*, 1881), and not less than thirty-five cases by Ph. Lussanna (*Fisiologia e patologia del cerveletto*, 1885).

In addition to these, the following cases may be quoted:—

The author's own case.

Girl, 15, cerebellar abscess after ear disease. Perversion and exposure.

Professor Moriz Benedikt: medico-legal case (*Archives de l'Anthropologie criminelle*, 1891):—

Hugo Schenk, whose trial caused a great sensation in Vienna some years ago, was accustomed to form liaisons with servant-girls, and when he grew tired

of them—which was usually very soon—he murdered them. He was handsome, very intelligent, and an excellent talker. His sensual vigour was extraordinary, and being of a lazy disposition he exercised it for a living. He was executed at the age of thirty-six. Post-mortem it was found that his cerebellum was of extraordinary weight, namely, 194 grammes, *i.e.* over 25 per cent. above the normal.

Giuseppe Mainardi (*Allg. Zeitschrift für Psychiatrie*, 1873):—

A medico-legal case of a wholesale murderer and satyriacal maniac. *Post-mortem.*— Inflammatory lesion of cerebellum.

The following are examples of *priapism*:—

1. Girardin . . *Journal de Physiologie*, 1882. Hæmorrhage.
2. Guiot . . *Clinique des hôpitaux*, vol. i. Hæmorrhage.
3. Stokes . . *London Med. and Surg. Journal*, vol. v. Hæmorrhage.
4. Dungliesson *London Medical Repository*. Inflammation.
5. Demme . . *Militarchirurg. Studien*, 1864. Bullet wound.
6. Persille . . Oppenheim's *Zeitschr.*, 1849. Tumour with congestion.

7, 8. Elliotson . *Lancet*, vol. xvii. Two cases. Tumour.

9. Riffortz . . *Journal f. Chirurgie*, vol. xxiii. Tumour.
10. Friedreich . *Intracranial Tumours*. Case 6. Tumour.
11. Immermann *Berliner klin. Wochenschr.*, 1865. Tumour.
12. Pégot . . *Archives gen. de médecine*, vol. xix. Tumour.
13. Andral . . *Ibid.* Tumour.
14. Mignot . . *Gazette hebdomadaire*, 1875. Tumour.

Also Mance, Dubois, Falret, etc.

Marshall Hall noticed many cases of priapism when the upper cervical vertebræ were the seat of the injury.

The following are examples of *satyriasis*:—

1. Crichton-Browne *West Riding Lunatic Asylum Medical Report.*, vol. ii. Injury.
2. Foot . . . . *Dublin Journal of Medical Science*, 1872. Tubercular disease.
3. Otto . . . . *Archiv f. Psychiatrie*, 1873. Inflammation.
4. Bianchi. . . . *Lancet*, 1855. Inflammation.
5. Dunn . . . . *Medico-Chirurgical Transactions*, 1849. Inflammation.
6. Rossi . . . . *Il manicomio.* Inflammation.
7. Schüle . . . . *Sectionserg. b. Geisteskranken.* Inflammation.
8. Cáffort . . . . *Archives gen. de médecine*, vol. xv. Inflammation.
9. Hospital . . . *Annales médico-psych.*, 1875. Inflammation.
10. Bottentuit. . . *Bulletins de la Soc. anat.*, vol. xliv. Hæmorrhage.
11. Martineau . . . *Ibid.*, vol. xxxiv. Tumour with cong.
12. Bordier. . . . *Ibid.*, vol. xl. Tumour with cong.

The following are examples of *nymphomania*:—

1. Jastrowitz *Localisation im Gehirn*, 1888. Inflammation.
2. Payen . . *L'Encéphale.*
3. Spies . . *Traumatische Manie*, 1869. Hyperæmia.
4. Williams. *Journal of Mental Science*, 1869. Inflammation.
5. Fossati . *Journal de Phren.*, vol. v. Inflammation.
6. Combette. *Journal de Phys.*, vol. xi. Inflammation.
7. Meschede. *Allg. Zeitschr. f. Psychiatrie.* Suppuration.

8. Hitzig . . *Archiv für Psychiatrie*, 1884. Suppuration.
9. Bennett . *Gazette médicale*, 1834. Tumour.
10. Ebstein . Virchow's *Archiv*, vol. ii. Tumour.

The following are examples of *perversion* :—

1. Skae . *Edinburgh Medical Journal*, 1866. Injury.
2. Paxton *Journal of Mental Science*, 1890. Inflammation.
3. Mühr . *Archiv für Psychiatrie*, 1875. Atrophy.

The following are examples of *atrophy* of cerebellum where castration was performed before puberty :—

Dannecy . . . . . *Annotations pathologiques.*
Larrey . . . . . *Bulletins de la Soc. anat.*, vol. v.

The following are examples of *degeneration* and atrophy of cerebellum after destructive disease of genital organs :—

Amaldi . . *Rivista sperimentale di Freniatria*, vol. xxi.
Levison . . *Lancet*, 1851.
Bahrdt . . *Jahrbuch f. Kinderheilkunde*, 1874.

The following are examples of *impotence* :—

1. Thisu . . . . . *Archives gén. de médecine*, vol. xii. Suppuration.
2. Huss . . . . . *Seraphim Lazaret Report.* Suppuration.
3. Matin . . . . . *L'Union médicale*, 1868. Destruction by tumour.
4. Obernier . . . . . *Tumours of the Brain.* Destruction by tumour.
5. Millenberger and Robin *Gazette méd. de Paris*, 1855. Destruction by tumour.
6. Krohn . . . . . *Journal of Nervous and Mental Disease*, 1892. Atrophy.

7. Curling . . . . . *Diseases of the Testis.* Atrophy after injury.
8. Editor . . . . . *American Medical Intelligencer,* 1839. Atrophy after injury.
9. Fiedler . . . . . *Zeitschrift f. rat. Medizin.* Atrophy.
10. Fox . . . . . *Journal of Mental Science,* 1891. Atrophy after injury.

The following are examples of the *return of menses* in old women (age 70) owing to hæmorrhage in cerebellum :—

Andral . . . . . *Lancet,* 1836.
Romet . . . . . *Revue médicale,* 1842.

The following are examples of *arrested growth* of sexual organs, with arrested development of cerebellum :—

1. Wigglesworth *Journal of Mental Science,* 1893.
2. Crisp . . . *Lancet,* 1840. Man of 47 like boy of 8.
3. Seppilli . . *Rivista Sperimentale di Freniatria,* 1879. Woman of 32 who never menstruated properly.
4. Verdelli . . *Rivista clinica,* 1874. Boy of 9 like age 3 (cerebellum size of a walnut).

The following are examples of *premature development* of sexual organs in children :—

1. Carus . . Cannstatt's *Jahresb.*, 1842. Girl fully developed at 4. Abnormal size of cerebellum.
2. Elliotson . *Lancet,* 1837. Girl fully developed at 5. Tumour.
3. Eisenschütz *Jahrbuch für Kinderheilkunde,* vol. ii. Boy fully developed at 8. Tumour.

Valentin, Budge, Spiegelberg observed contraction of the uterus after stimulation of the cerebellum. On the other hand, Professor Eckhard of Giessen and Professor Exner of Vienna have recently made out that excitation of the point of issue of the plexus brachialis from the cervical vertebræ causes these contractions, and that they cease when the plexus is divided.

Goltz destroyed the *middle* lobe of the cerebellum, and found the functions here attributed still intact. This is quite natural, for lesions of the middle lobe were already well known to cause inco-ordination of movement. If there is a centre for libidio sexualis in the cerebellum at all, it must be in the lateral lobes. Flourens, Luciani, and André have destroyed the entire cerebellum and still found this instinct intact, except that the inco-ordination of movement prevented the animal from exercising it. To this our answer is, firstly, that the destruction is probably incomplete, for Risien Russell (*Philosophical Transactions*, 1894), as the result of his experimental researches into the functions of the cerebellum, declares that the destruction of the entire cerebellum is a surgical interference of such magnitude that nearly all the animals experimented on succumb to the immediate consequences of the operation.

Secondly: that the mutilation practised by these physiologists actually excites the functions of the cerebellum. Thus Magendi was struck to find so many cases of irritation of the generative ap-

paratus coinciding with atrophy or more or less destruction of the cerebellum. Carpenter's experiments showed that even section of the spinal cord in the lumbar region, which is the admitted centre for the potentia cœundi, does not prevent the act from being performed.

The cerebellum, both in man and animals, is very small at the time of birth—from $\frac{1}{6}$th to $\frac{1}{11}$th of the weight of the cerebrum—and increases in size as one mounts the scale of life. Meynert found that the increase of the total weight of the brain, when the cortex has reached its full size, depends chiefly on the continued growth of the cerebellum, which organ in its absolute weight represents most definitely the scale of age of the rise and decline of manhood. Why is this?

Henry Head (*Brain*, 1894) finds that the pain and tenderness in diseases of the ovaries or testes is referred to the occiput.

Anyhow, there is the material of nearly 150 cases in favour of the theory that the sexual instinct is related to the cerebellum, and in the absence of evidence for any other localisation, we cannot agree with the critic who considered it "gross nonsense" to hold such a theory, but would recommend clinical and pathological observers to keep the theory in mind in cases of morbid or deficient manifestation.

It should be easy to test the following statements:—

Among the lower order of animals, those that have no cerebellum, nor any ganglion tantamount to

one, have no sexual propensity; while all possessed of a cerebellum, or a ganglion as a substitute, have; and the larger the cerebellum, in individuals of any given species, the stronger is this propensity in them, compared to other individuals of the same species in which it is smaller. Why are male pigeons, and the males of the common domestic fowl that have the thickest necks—we mean the greatest protuberance where the head and neck join—always the most amorous? Is this protuberance due to the size of the cerebellum, or can it be otherwise explained? This same protuberance can be found in unmutilated males of all our domestic quadrupeds—the horse, the cow, the sheep, and the hog. The thicker the neck at the point designated, the stronger and more ardent this particular appetite. And those of them in whom the cerebellum is earliest developed manifest that appetite at the earliest period. The cerebellum of those animals whose season of love and copulation occurs periodically, such as hares, deer, and most kinds of birds, sustains during that season a very striking change. It is fuller and more copiously injected with blood, and therefore much redder than at any other time; a condition which indicates a preparation for more vigorous action.

The emasculation of the males of our domestic quadrupeds at an *early* period of life is stated to prevent the development of the cerebellum. Hence the smallness of the neck of the castrated horse, ox,

sheep, and hog compared to that of the uncastrated one. And those that are castrated soon after birth have no sexual propensity. But in those castrated after maturity some share of the propensity remains, although the power of performance is taken away. And in these the cerebellum is diminished in size after castration, but never becomes so small as it would have been had they been castrated at an early period. To intelligent and observing agriculturists these facts are familiar. It is observed that emasculation affects materially no other portion of the brain but the cerebellum.

In the human race the cerebellum is very small until puberty, bearing to the cerebrum the proportion of about one to fifteen or sixteen; but after puberty, when the sexual passion becomes developed, the proportion is one to six or seven. It has been shown by the cases quoted that when the cerebellum is inordinately developed at an early period in a boy, there is precocious manifestation. Other cases show the effect of emasculation on male children. Their necks continue proverbially small, and in eunuchs the cerebellum is smaller than in women. If mutilated in infancy, there is no desire. If mutilated after puberty, or *at* that period, the desire remains, but is feeble.

Other cases show that injuries done to the cerebellum affect sexual feeling according to the condition they produce in that organ. Do they concuss and paralyse it, the feeling is extinguished.

Do they inflame it, the feeling is rendered more intense.

We need only add that, with the exception of one or two, the authors mentioned had no theory to sustain. They faithfully reported the cases they had witnessed.

Of course, it may be objected that the cases we have cited with reference to the cerebellar theory, and perhaps also with reference to the other localisation theories, are not all recent ones, some might even be described as ancient. But really is this a vital objection to the theories advanced? Such facts as that our modern students are trained to devote all their attention to the microscopical appearances of the brain in the different psychoses to the neglect of naked-eye appearances; the prevalence of the toxin theories to account for most forms of insanity; moreover, the lack of opportunity to study the early stages of mental disorders; as also the fact that intellectual changes are not inquired into sufficiently minutely, and character-changes are often disregarded altogether as not dependent on brain conditions; and last but not least, the contempt with which the localisation theory of *mental* functions has hitherto been regarded—all these facts explain sufficiently the lack of adequate material.

CHAPTER XIX

THE CRIMINAL FROM BRAIN DEFECTS AND DISEASE

WHEN we reflect how irritation, injury, or disease of the frontal brain can cause loss of control over the passions, and thus create an impulsive nature;

When we reflect how a slight ear affection, irritation, injury, or disease of the temporal lobes can cause offences against property and crimes of violence and homicidal mania;

When we reflect how irritation, injury, or disease of another part of the brain can cause all sorts of sexual excitement and give rise to offences against public decency, to bestial assaults, and various perversities;

When we read the large number of *medico-legal cases* in this work (see Index), in which men have committed crimes owing to defective working of the brain, and reflect that the symptoms often lie latent for years —accidents in childhood giving rise to mental disorders and criminal impulses in manhood—

We are bound to admit that, in certain cases at

least, it is the expert physician who should determine the cause of the crime, the responsibility of the criminal and his treatment, and not the judge and jury.

From the cases quoted, it will be seen that criminal impulses may exist without the usual signs of insanity, so that the disease may remain unrecognised. Indeed, many of the cases of wholesale murder of close relations of which one reads in the daily press are the outcome of such latent brain disorder, but they rarely come before the legal authorities, because the culprit after the homicidal fit generally commits suicide.

Sometimes our prison authorities recognise the insanity after the conviction of the prisoner. Thus Dr. J. F. Sutherland found confirmed insanity in

1 of 30 homicidal criminals,
1 of 35 incendiaries,
1 of 87 sexual offenders.

W. Sommer (*Allg. Zeitschrift f. Psychiatrie*, vol. xl.) has shown irascibility and delusions of persecution to be the most common forms of insanity in criminals, a great many having hallucinations of hearing.

Dr. Donkin, one of H.M. Commissioners of Prisons, at a recent conference at Birmingham made the assertion—

"The bald statement may be accepted that the weak-minded amount to between 10 and 15 per cent. of the total number of persons committed to prison:

the true maximum is probably even higher than this."

In another place in the same address he said—

"Owing to their inherited incapacities and to certain surroundings, a large number of mental defectives tend to become criminals, and a considerable proportion, even 20 per cent., of so-called criminals or law-breakers are demonstrably mentally defective."

Then there is the disease of epilepsy, which every expert knows may give rise to serious mental disorder. Those suffering from that terrible affliction are particularly liable to homicidal acts, and should not be held accountable, or a diminished responsibility should be allowed. All is well if the epileptic have genuine convulsions, which any layman can recognise. Sometimes, however, there are no convulsions, but the fit is replaced by a paroxysm of mania, in which the epileptic may perform actions as automatically as his convulsive movements are performed at other times. In other words, the nerve storm may discharge itself in a physical manner, or by psychical action alone, or sometimes in both ways, one following close upon the other.

Dr. Clouston states that a murder by an epileptic should usually be looked upon as being as much a symptom of his disease as larceny by a general paralytic; and further, that if a man has been

subject to regular epileptic fits, and commits a homicidal act in an impulsive and motiveless manner, the presumption would be very strong that he was not responsible for his actions.

There is a growing demand for the closer medical inspection of prisons and jails. Attached to each prison should be an expert physician.

It has to be remembered, too, that at the expiration of their sentences these criminals from brain defects and disease are discharged to mingle in the community, and either reappear as criminals or are liable to perpetuate their kind, thus forming new foci of insanity and feeble-mindedness.

People are greatly horrified at the alleged increase in the certified insane, but how much greater would be their shock did they know the number of persons who are not fit for an asylum according to the legal tests required, but who all the same suffer from mental disease and are not responsible for their actions. They may be harmless lunatics, they may be clever and good-hearted men, but with occasional homicidal impulses. The well-to-do consult the lunacy expert, the poor go to prison, and some end their life on the gallows. The law does not recognise as yet that peculiar mental disease which gives rise to delusions and dangerous impulses, yet leaves the individual capable of fulfilling the duties of daily life.

A man's brain may be weakened or diseased, yet he may fall short of the legal tests of insanity. He

may exhibit no delusion, may know the difference between right and wrong; he may be aware of the consequences of his actions, and may be quite capable of doing some things yet unable to do others.

It is monstrous that the "knowledge of the difference between right and wrong" should be made the legal test of insanity. The lunatic knows the difference as well as we do, and often feels it much more keenly; and it is this feeling which often drives him to despair or to some fearful act, which the same man with easier conscience would have avoided. The power to resist is absent in the one and present in the other.

There are men perfectly sane according to the legal test who are tormented with a horrible impulse to do, and perhaps actually do, what they know and loathe as wrong. The driving impulse in them is so strange and contrary to their true nature and desire, so repugnant and yet so compulsive, that in olden times it seemed explicable only as a positive possession by the devil or other evil spirit.

According to the legal test, an insane person is fully responsible for what he does when he knows the nature of his act, and that it is a wrong act. Consciousness of the act would mean in such a case power to control the mad impulses of a deranged mind. You may as well say that a person in convulsions is a strong man, and is culpable if, being conscious of them, he does not stop them.

It is the old metaphysical self-observation by sane minds, and its natural result is the fixing of a sane standard of feeling and action as the measure of insane feeling and action. Surely the right method would be, if it were possible, self-observation in abnormal mental states. For example, no one who reflects on his own experience in dreams, remembering how strangely he thinks and feels in them, and how entirely he loses possession of himself, can believe that a madman is responsible for what he feels and does in the waking nightmare which madness sometimes is.

The legal test assumes—at any rate, its defenders sometimes assume—that reason is the motive force of human action—that is to say, for example, that people fall in love from reason, and when in love embrace from reason. How absurd! How many times has feeling its reasons which reason cannot fathom. The driving impulse by which men are moved to act comes from feeling, not reason; disordered feeling, therefore, is quite capable of actuating the most disordered action without consent of, perhaps directly against, reason. Had mankind been moved by reason in their travail through the ages, they would not have been where they are now. For it is in the heart, not in the head, that their deepest faiths are rooted, and he does an ill service to religious faith who strives to base them on the feeble apprehensions of human reason. A psychology which finds the motive power

of action in knowledge might be likened to a science which should find the cause of the tidal movements not in the moon but in the moonshine.

But it may be contended that reason, though it does not supply the motive force of action, can still control and guide it. That is so, no doubt, within measure. Let reason and feeling be wed in fit harmony, if possible, since they cannot do without one another; reason without feeling being impotent to act, and feeling without reason being tyrannical in act. It is not true, however, that reason can always control the desire when it knows its good and bad quality and can appreciate the right or wrong of it. A mad desire is sometimes mad enough to have its convulsive way in defiance of reason. Nevertheless, though that is what experience says plainly, legal theory will not have it so.

Whoever doubts that the law as to the responsibility of criminals requires amendment, so as to be brought into line with modern science, is requested to read the account of the following two cases and to compare one with the other :—

After being two years married, a working couple had to live separate because the man was out of work, but they actually visited each other. He was fond of her and had no reason to complain of her, only he did not want her to work for his living as well. According to medical testimony, this man had been thrown from a horse, with his right temple against a stone wall, so violently that he was perfectly senseless for several days, and confined

to the hospital for a month. It was thought then that he would become of unsound mind. His general demeanour had altered, but not much.

Four years later, this man received a second severe injury, when he fell from a ladder, again on to the temporal bone. He now was considered cracked, and had to take inferior situations, such as potman.

For no reason whatever, in the midst of affection, he one day cut his wife's throat. While under sentence of death, he told the clergyman that he had murdered his wife because another woman had said she was unfaithful. Like an imbecile person, he believed it at once without inquiry into its truth.

An injured brain is unable to stand alcohol. This man, it was shown, had drunk before the murder, and the judge declared: "If a person by drinking deprived himself of his senses, and whilst in that state committed a crime, he could not plead the insanity of drunkenness in justification, because he voluntarily deprived himself of the power of his actions." The man was hanged.

Now let us compare this case with another:—

G. W., a young man, received a blow on the temple from a cricket ball. He was knocked down, and remained insensible for several hours. For several days after the injury he remained dull and stupid. Slight spasmodic twitchings of the leg and arm were noticed on the opposite side to that injured, and at the same period a daily and increasing change of character. Before the accident he was kind and affectionate in his manner, and particularly attentive to the commands and wishes of his parents; but now he became spiteful, revenge-

ful, and perfectly reckless. He was constantly quarrelling with his brothers and sisters. If requested to perform a duty, he became impertinent; and if checked in the least, he swore and used the grossest language. He was extremely mischievous. He destroyed the furniture whenever he had the opportunity, and did harm to his younger brothers and sisters. He was detected in an attempt to fire a quantity of wood in the cellar of his father's house. He threatened to butcher the whole of his family with a mallet, and seemed to enjoy the terror of his relations when they became alarmed at the destructive nature of his actions.

Physically he appeared quite well. He answered questions with the greatest composure and intelligence, but the moment he returned to his own home and was left uncontrolled, his actions became violent in the extreme.

This patient got well after treatment. Supposing he had been older and left to his own resources without supervision, he might have killed some one, and, according to the justice exercised in the previous case, he too would have been hanged.

Yet who will say that there is any marked difference between the two cases? The difference is one of degree only. Both were morally irresponsible for their actions, if not legally so.

The law should be amended so as to permit, in proved cases of uncontrollable impulse falling short of legal insanity, confinement in suitable asylums, subject, where expedient, to release on probation, with final discharge on cure. These reception

houses should be for the observation and treatment of all doubtful cases, and the physician in charge should have to report to the judge the nature of the disease and his opinion as to the full or diminished responsibility or complete irresponsibility of the accused.

Enough has been said to show that crime is not always the outcome of wickedness, but often due to disorder or disease of the brain, and that therefore the medical and psychological expert should be called upon in all doubtful cases for a diagnosis.

From the cases quoted it is also evident that the cure of criminal impulses when due to focal brain irritation or disease can be promised with full certainty; and if this be so, it is not a wild speculation to assert that even the ordinary habitual criminal, who defies all moral treatment and the severest of punishments, may one day be treated successfully—by a surgical operation.

But if this procedure is considered to belong to the realms of imagination, it cannot be denied that the evidence collected in this book, should it receive confirmation, will help us to take a great step towards the prevention of crime, not only because it will enable us to determine with increased certainty the diseases which give rise to criminal impulses, but because it will enable us—most important of all—to recognise the cases of imbecility with criminal propensities—"criminals who have committed no

crime as yet"—at an early age, before they have acquired facility in crime.

In conclusion, I can only support the propositions of Dr. Jules Morel, the learned psychiater, who has contributed so much to our knowledge of the pathology of crime, namely—

1. For the benefit of public health, the Government should care for the young degenerates.

2. When these degenerates attract attention by their acts or conduct, these should be investigated and reported on officially as well as medically.

3. As far as possible, these degenerates should be placed in medico-pedagogic institutes directed by competent authorities.

4. Parents should have the privilege of placing voluntarily their morally defective children in such institutes.

CHAPTER XX

THE SKULLS OF THE INSANE

It is curious that psychiatrists with few exceptions pay little regard to the size and shape of the organ with whose disease they are concerned. Is it because they are convinced that pathological conditions of focal origin cannot be diagnosed during lifetime, or is it that they still cling to the old mistaken notion that the shape of the brain cannot be estimated by the shape of the living head? Since there are still some physicians who hold that latter opinion, it may be as well to quote some recognised authorities on this subject:—

Professor Cunningham of Edinburgh University: "To the predominant growth of the cerebral hemispheres is due the lofty cranial vault of the human skull; to the different degrees of development and to the different forms which they assume are largely due the variations in cranial outline in different individuals and different races. The cranium expands according to the demands made upon it by the growing brain." Professor Cunningham recom-

mends the study of skull peculiarities, brains being less available for investigation.

Professor Symington of Belfast University: "It is the brain growth that determines the form of the cranium, and not the skull that moulds the brain into shape. There can be no doubt that within certain limits the external form of the cranium serves as a reliable guide to the shape of the brain. Indeed, various observers have drawn attention to the fact that in certain regions the outer surface of the skull possesses elevations and depressions which closely correspond to definite fissures and convolutions of the brain."

Sir George M. Humphry said: "The skull is moulded upon the brain, and grows in accordance with it. The size and general shape of the brain may be estimated with tolerable accuracy by the size and general shape of the skull. The frontal sinuses and the projecting ridges, the inequalities on the surface of the skull, which have no correspondences in the interior, do not amount to much, and do not affect the principle that the skull is moulded upon and fitted to the brain, and that its exterior does, as a general rule, convey pretty accurate information respecting the size and shape of that organ."

Sir William Flower said: "The skull is a fair index of the development of the brain in its different regions, and ought therefore to be studied"; adding that "the longer he lived he saw fresh beauty and

meaning in every line and configuration of the cranium."

Frederick Petersen (*American Journal of Insanity*, 1895): "Although single convolutions do not impress themselves to such an extent upon the outer surface of the skull as to be clearly recognised, this is not altogether the case with groups of convolutions. Groups of convolutions do modify the shape of the skull, do possess visible representation upon its outer surface."

Even at a very early age the convolutions are found impressed on the interior table of the cranium. Manouvrier pointed out that the impressions of the convolutions on the inner surface of the skull are unshakable proofs—firstly, that the brain fits closely to the skull; and secondly, that its position does not change, but it lies immovable (*Société d'Anthropologie de Paris*, 1885).

Dr. Ferrier, Harveian Oration, 1902: "The brain fills the cranial cavity like a hand in a glove, and is closely appressed to the interior of the skull-cap."

Professor Alexander MacAlister of Cambridge University wrote to the same effect. And so did Sir Lauder Brunton.

The bones of the head, like all other bones of the body, are alive, and their life is animal life; they are permeated by blood-vessels and absorbents; their materials are continuously in the course of removal and re-deposition.

The want of entire and absolute parallelism between the two tables of the skull has sometimes been interposed as an insuperable objection to this mode of estimating the size of the brain; and even admitting that it does sometimes occur, this want of parallelism is of little account, for the whole thickness of the skull seldom exceeds from one to three lines (one-tenth of an inch is the average), except at the frontal sinus and occipital protuberance, whereas the difference in the development of the brain extends to inches. If we describe a head as being high, wide, or long, it is the brain that is developed in those directions, and it matters little whether the enveloping cranium is a line or two thicker at some points or not.

Skulls vary in thickness, but since nature, in forming the bony frame of healthy people, has a uniform mode of working, a healthy man may be judged to have a thick skull if the other bones of the body are also strong and thick. On the other hand, we may infer from thin bones of the limbs a comparative thinness of skull under normal conditions.

As regards the frontal sinus, it may be pointed out that it does not exist before puberty, that it is extremely small in females, and does not exceed the width of the root of the nose in normal male adults. It is only in old age and in chronic idiocy and dementia that we find it of abnormal size.

Some objectors have asserted that the muscles of the head, by the traction and pressure which they exercise upon the cranium, contribute greatly in determining the form of the head. But this cannot be so, for the brain will stand no pressure.

The size and weight of the brain is scarcely affected by stature and muscular development. Large heads are quite common with little men.

There is therefore no hindrance to the study of the brain development in the insane, and if the author's own experience goes for anything, it will prove most valuable in the better understanding of the patients and their mental states, and in some abnormal cases it may lead the way to surgical treatment. If coarse abnormalities, according to older authorities, occur in 20 to 28 per cent. of the insane, we may be sure to find double that percentage with the help which we derive from our localisation theory. Such, at least, is the author's opinion, and it is well worth the investigation of asylum physicians.

Dr. J. Konrad, Superintendent of the State Lunatic Asylum in Hungary (*Ungerische Medizinische Presse*, 27th November 1899), says—

"Measuring 1361 heads, and making every allowance for racial peculiarities, typical heads and malformations are much commoner amongst the insane than amongst normal men. Malformation and deviations from the normal type are to be regarded as external signs of psycho-pathic disposi-

tions. Deviations from the normal type exist in 7 to 8 per cent. of healthy people, and in 20 to 28 per cent. of the insane—that is, three to four times as often. Abnormal crania have therefore an etiological significance."

CHAPTER XXI

THE OPERATIVE TREATMENT OF INSANITY

Physiologists have admitted the localisation of functions of the brain for some thirty-five years already, yet we have hitherto left operative procedure on the brain to neurologists. Few medical psychologists have thought of the possibility of a surgical cure. Some of the cases operated on by neurologists for motor or sensory disturbances suffered from a psychosis as well, and with the removal of the source of the physical ailment the mental trouble was removed simultaneously. Neurology has made such strides of late years that psychiatry should not remain behind. It is my firm belief that were we seriously to consider the possibility of localisation of mental disorders—in their early stages, of course—we should soon make valuable discoveries in this field of science. Lunacy is one of the most dreaded diseases which afflict mankind, and even patients who are discharged as cured find, unfortunately too often, that the confidence that used to be placed in them by their friends and

acquaintances is not renewed. Any theory, therefore, which gives hope of some success in the treatment of the insane is deserving of our careful consideration and examination, even when not supported by such a mass of clinical material as is contained in this work.

Hitherto surgical methods have been adopted only in rare cases, as the possibility of localising the various forms of mental disorders is still questioned by many lunacy physicians. Their experience of asylum cases, in which, owing to the length of time of the disease, the whole brain has got damaged, does not favour the localisation theory. But, excluding mental disorders caused by toxins and derangements in the blood circulation, it must be admitted that the disease must have started somewhere, for there is not a patient who has not some portion of his mental constitution still sound when certified, and often there is a change only in one or other of the primary emotions, and only one or no delusion.

We never see a complete lunatic, and however old-standing the disease, a careful investigation of the history of the case may lead to the discovery of the focus of the primary lesion. The cases cited show depressed bone, splinters from the inner table, osteophytes, weakened bone from circumscribed inflammation, hæmorrhage, cysts of hæmorrhagic origin, foreign bodies within the cranium (bullets), tumours, adhesions from circumscribed meningitis,

etc. All these are conditions which warrant interference.

Thus in a considerable number of cases a constant irritant is causing mental symptoms, and is within ready reach of operative interference. In many instances it apparently suffices that that sensitive structure, the dura mater, be irritated, while the brain itself may be perfectly sound. If this be so, *cranial* operation is all that is necessary for the relief of the patient, and the more alarming cerebral surgery need not be undertaken.

In every case of insanity in which there is a history of head injury and the locality injured corresponds with the locality indicated by the symptoms, as described in this work, operation should positively be undertaken, even if there be no external sign of trauma, such as a scar, or depression of bone, and although there is no local tenderness or fixed headache.

The length of time that elapsed between the accident and the onset of the symptoms apparently need not be considered.

J. Christian (*Archives de Neurologie*, vol. xviii.), analysing 100 cases of traumatic insanity, found that—

In 54 cases	the	interval	was from	1– 5 years.
„ 21	„	„	„	5–10 „
„ 11	„	„	„	10–20 „
„ 7	„	„	„	20–30 „
„ 7	„	„	more than	30 „

Powell found that in 47 of the cases in which the interval is stated, the symptoms appeared

In	8	cases	immediately.				
„	13	„	in the first 12 months.				
„	11	„	between 1 and 5 years.				
„	8	„	„	5	„	10	„
„	4	„	„	10	„	15	„
„	2	„	„	15	„	20	„
„	1	„	„	20	„	30	„

That there is no limit to the time that may elapse when surgical treatment may still be successful, is also shown by the cases of insanity mentioned in this book as treated by operation.

Two	were	cured	3	years	after the accident.
Five	„	„	4	„	„
Three	„	„	8	„	„
Two	„	„	11	„	„
Two	„	„	16	„	„
One	was	cured	25	„	„
And one	„	„	31	„	„

Other cases, too, not due to injury, but due to tumours, hæmorrhage, etc., will be accessible to operative treatment if the localisation theories advanced in this work are confirmed by longer experience. As Dr. Claye-Shaw has said—

"Localisation is the immediate and pressing need in the treatment of brain symptoms, whether in the general domains of neurology or in the particular one of insanity.

"The surgeon has already usurped much of the

territory of the physician. It seems time that he took in hand some of the problems of insanity.

"Recent surgery has proved how tolerant the brain is of interference, and it may be fairly prognosticated that with a better knowledge of the localities specially affected in insanity of different kinds, the application of direct interference will be of service at present beyond our dreams."

Possibly in doubtful cases of tumour or hæmorrhage, puncture of the brain may be undertaken as performed by Middeldorpf, Souchon, Schmidt, Kocher, Payr, and more especially by Neisser and Pollack. We certainly gather from their observations that in suitable cases excellent results may be obtained both from the diagnostic and the therapeutic point of view.

The success which has already been won by trephining cannot but act as a stimulus to the undertaking of surgical operations, which hitherto have been to a certain extent exploratory, but which, owing to the continually accumulating mass of clinical and pathological evidence, will be placed on a sounder basis, and will be approached with less hesitation. Surgical treatment will be resorted to in the future all the more, for in most cases it is cranial rather than cerebral operation that is needed for the relief of that most dreaded of diseases, insanity—at all events, when caused by injury.

But let there be no mistake! It would not be

fair to produce cases of intoxication as evidence against the localisation theory, and surgery is not the only method of treating insanity—in fact, it is only suitable in a limited number of cases. There are other methods of treatment, which have been described in detail in the author's other works.

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